

COMPUTERWORLD

This artful Michelangelo could unleash IS havoc

Serious virus damage predicted for March 6

BY MICHAEL ALEXANDER
CW STAFF

A loose confederation of virus researchers, antivirus software developers and several other groups stepped up campaigns last week to alert users to the potentially disastrous effects of the Michelangelo virus.

The virus is expected to remain dormant until March 6 — the Italian artist's birthday — and when activated, will infect floppy and hard disks used with IBM Personal Computers and compatibles.

The Anti-Virus Methods Congress, an industry group of researchers and antivirus software developers, issued its first-ever advisory last week to warn computer users about the virus' possible dangers (see story page 8). "The speed at which the virus has spread has

been unmatched by any other virus," said Dick Lefkon, president of the AMC and an information technologies professor at New York University.

The Computer Emergency Response Team, based at Carnegie Mellon University's Software Engineering Institute, said it recently issued a similar advisory, its first ever concerning a PC virus.

Past scares about viruses such as those designed to activate on Friday the 13th and Columbus Day proved to be unfounded. However, the Michelangelo's potentially devastating nature has led several virus experts to warn users to take appropriate measures to protect against being infected.

The experts are also concerned that because of the Michelangelo's newness, unwary

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Netware 3.2 may miss mark

BY JIM NASH
CW STAFF

PROVO, Utah — Early reports on Novell, Inc.'s much-anticipated Netware Version 3.2 have elicited cool responses from network managers.

Several managers reacting to reports of planned Netware 3.2 features last week said that despite the inclusion of much-desired directory services, the forthcoming update does not address some of their primary concerns, according to what they have heard so far.

These concerns include better virus protection and continued support for connectivity products between Netware and 3Com Corp.'s defunct networking software. For example, Mark Estridge, network manager at MCI Communications Corp. in Richardson, Texas, noted that virus protection needs to be beefed up on Netware and should be incorporated in new versions of the software.

There are third-party solutions, Estridge said, but often they are incomplete, present compatibility problems and fur-

ther complicate network management.

Roger Goss, a network manager at Eastman Kodak Co. in East Rochester, N.Y., lauded Novell's pledge to maintain con-

Yet as blase as administrators may be about what has leaked out so far, Version 3.2's expected directory services and easier installation will be more than enough to prod them into upgrading, they said.

The long-awaited directory services software is the one feature seen capable of lighting fires under users, and, according to some observers, it is what makes Version 3.2 a major upgrade.

The X.500-compliant directory is a set of functions said to simplify management and use of networks. It will enable Netware users to share resources across large networks without having to know the resources' locations. It is this ability — nonexistent on Netware today

— that competitor Banyan Systems, Inc. has been able to exploit with some success in large corporations with its Streettalk directory.

Continued on page 14

LAN ho!
Users waiting for Novell's next release, Netware 3.2, can expect the following:

- Backward compatibility with existing Netware interfaces.
- Distributed directory services for a global view of the network.
- Compatibility with the new network management software.
- Object-oriented software support.
- System-auditing software.
- Easier installation.
- Support for CD-ROM devices hanging off the server.
- AIX support.

CW Chart: Michael Higgins

nectivity between Novell and 3Com's lines until 1995. Goss, however, is looking for a more automatic method of using tape backup machines with 3Com servers.

Increased satisfaction

Users of mainframe general ledger software — particularly users of CA's offering — are happier with their products overall than they were in 1990

See Buyers' Scorecard, page 78

Product	Vendor	Score
Response base: 160		
1990 1992		
Computer Associates		58 64
Dun & Bradstreet Software's M&D		60 64
Global Software		63 63
D&B Software's MSA		60 63
Average		60 64
Highest possible score		100 100

IBM PC future rides on system advancements

SLC chip: Innovation to cost users more

BY MICHAEL FITZGERALD
CW STAFF

ESSEX JUNCTION, Vt. — On the snow-covered hills surrounding IBM's massive semiconductor facilities here, local children sled on saucers that resemble next-generation versions of the silicon wafers made inside the plants.

In this out-of-the-way corner of the country, IBM engineers work on what may be the single most important piece of the company's future as a personal computer hardware maker: the SLC chip, a microprocessor that will

power two of the three systems IBM is expected to unveil tomorrow (see story page 12).

IBM touts the SLC as a major differentiator, proof that the behemoth will no longer blunder but innovate in ways its smaller rivals cannot. No other vendor has the right to build derivatives

Continued on page 12



IBM's Lodak leads SLC into next-generation chip technology

Questions abound as full OS/2 2.0 delivery nears

BY ROSEMARY HAMILTON
CW STAFF

BOCA RATON, Fla. — Technicians at IBM's OS/2 development laboratory here last week showed OS/2 2.0 running a native 32-bit application alongside several windows in which Microsoft Corp. DOS applications and Windows-based programs were operating.

Data was then moved from the OS/2 2.0 application to one of the Windows applications.

This seamless integration is the last major hurdle IBM needs to jump before the company can deliver the general availability version of OS/2 2.0.

Despite this achievement, IBM could face an uphill battle when it ships 2.0 at the end of next month as planned and runs into the incredible Windows momentum belonging to Microsoft.

While it may appear that IBM will provide a technically solid desktop operating system, it is

unclear whether it can overcome past credibility problems and effectively sell against Microsoft.

IBM, better known for its marketing might than for technical prowess,

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INSIDE

IBM's Joseph Guglielmi to head Taligent joint venture with Apple. Page 16.



Novell bundles 'burst mode' software with multiprotocol router. Page 8.

Product Spotlight — To serve the '90s, accounting software needs a revamp. Page 73.

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- 6 Novell and UB force users to choose between managing LANs from the hub or from the operating system.
- 8 Intel's Lanprotect could safeguard Novell Netware 3.1 LANs against more than 850 viruses.
- 10 Netframe pushes server performance up by using Intel 50-MHz 486 chips for the first time.
- 12 IBM's 32-bit OS/2 team has taken a unique approach to development.
- 14 The network market is moving toward platform-independent services.
- 15 Trellis plans to enhance Banyan's Vines with modifications to its Expose network management package.
- 16 IBM's executive shuffle continues, with Joseph Guglielmi taking on the IBM/Apple object-oriented joint venture.
- 20 The next round in the workstation wars may go to HP when it brings out its 50% more powerful PA-RISC microprocessor.
- 24 Two executives at a small computer distributor were caught red-handed with 3,000 bootleg copies of MS-DOS.

Quotable

"Bill Gates talks about information at your fingertips, but we have information for your brain."

MICHAEL KOGAN
IBM

On 32-bit OS/2.
See story page 12.

DESKTOP COMPUTING

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EXECUTIVE BRIEFING

■ **IBM's SLC chip** — a hybrid of the Intel 386SL and 486 microprocessors that is due to become standard on two IBM models this week — is touted by Big Blue as proof that the giant firm can innovate in ways its smaller rivals cannot. Users liked the chip's beefed-up performance but wonder if its price will be low enough. **Page 1.**

■ **Maintenance-free software** is the wave of the future. While the technology to fully realize this goal is not yet available, it's not too early to design cleaner software. How? Staffs can use techniques such as software layering and parameterization to reduce code modifications. **Page 87.** An even nearer term possibility than no-maintenance software is self-service commercial software — programs vendors can build that are self-installing and easily customizable by the average user. **Page 33.**

■ **Beware the virus of March:** Users of IBM PCs and compatibles may be in peril from the Michelangelo virus, expected to devastate data on infected disks on March 6. While fears may be exaggerated, 'better safe than sorry,' watchdog groups say. **Page 1.**

■ **'What's in it for me?'** If you're a Microsoft Windows user awaiting the outcome of the long-running *Apple v. Microsoft* copyright suit, the answer could be 'trouble.' Speculation is growing over what could happen if Apple wins. **Page 37.**

■ **According to accounting experts,** the 1990s accounting system will sport a GUI, function within a client/server architecture and support multiple accounting languages for global business operations. **Page 73.**

■ **C. Michael Armstrong,** IBM exec seen as most likely to succeed Chairman John Akers, is leaving Big Blue to take on the top office at Hughes Aircraft. **Page 4.**

■ **Eagerly awaited directory services make Novell's Netware Version 3.2 a big deal,** early users say. But network managers are still waiting for Novell to address other concerns, including a need for better virus protection. **Page 1.**

■ **Different times, different strategies** is the theme at New York Life, where a corporate restructuring has placed IS staffers on product development teams, and where the drive for new technology has taken

a backseat to the need to serve the customer. **Page 89.**

■ **Dissatisfaction remains the top reason** for IS pros to seek new jobs. According to Drexel University researchers, only the recession-related job drought is keeping many unhappy workers from jumping ship. **Page 89.**

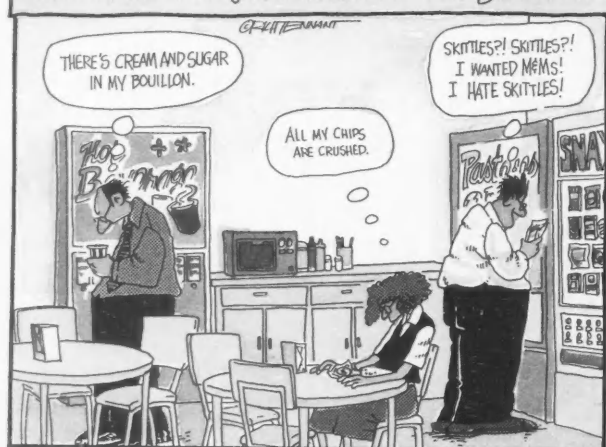
■ **Instead of banning CASE,** users might do better to find its niche in an overall application development plan. That was the message conveyed by CIOs surveyed by Deloitte & Touche. **Page 63.**

■ **IBM may have given a fresh endorsement** to its LAN Server this month, but some users say they want to see more hard evidence of IBM's commitment to the network operating system before they make their own commitments. **Page 49.**

■ **On site this week:** Wiring that had the simplicity of a bowl of spaghetti convinced Enron Gas Services there had to be an easier way to connect users to new networks when the users change offices. **Page 55.** Faster, better answers to customer service queries was the end result when Northern Trust in Chicago blended a voice-response system with new call-routing technology and image processing. **Page 61.** The growth of cellular communications has fueled an open systems move at Motorola, where the company's own Unix-based systems are replacing an IBM mainframe. **Page 49.**

The 5th Wave

The computer virus crept silently from network to network, until it found its way into the cafeteria vending machines.



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Roll-Back For Complete Backward Recovery	✓	
Case Tool Support	✓	
Bulk Access	✓	
Commit Continue	✓	
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Armstrong jumps IBM ship

Akers' heir apparent leaves Big Blue for Hughes' wild blue yonder

BY NELL MARGOLIS
CW STAFF

ARMONK, N.Y. — Two months ago, industry observers sized up the executive shifts occurring in the course of IBM's massive reorganization and tagged IBM World Trade Chairman C. Michael Armstrong as the company's heir apparent.

Apparently, they erred.

Last week, Armstrong — a 31-year Big Blue veteran who served on the firm's five-member management committee alongside Chairman John Akers and President Jack Kuehler — signed on as chairman and chief executive officer of Los Angeles-based Hughes Aircraft Co.



Armstrong's job switch surprised several IBM execs

startled" by the news of Armstrong's imminent departure. "I see it as a reflection of the turmoil going on at IBM," he added.

From the image standpoint, Djurdjevic said, IBM could be losing more than a key executive. "It doesn't help that [Armstrong] sees a better future for himself in the aerospace/defense industry than he does at IBM," he noted.

Fred Cisewski, IS senior vice president at BancSouth NA in Atlanta, took a more sanguine view.

"I just looked at [the announcement] and said, 'Gee, the guy must've had an opportunity he couldn't pass up,'" Cisewski said. "I didn't consider it a big deal; this happens a lot in business."

Precisely, Armstrong agreed. "I love it," he said of the job he will take as of March 31. The opportunity to be at Hughes' helm while the defense contractor and General Motors Corp. division attempts to recast itself and expand its presence in the commercial market, he said, arose at a time when "I was very happy at IBM."

The prospect of an actual CEO post, rather than one possibly in the cards, was also alluring, Armstrong hinted. "I don't think John Akers is anywhere near ready to retire," he said.

IBM's chairman is due to retire in 3½ years. Until recently, Armstrong and IBM Senior Vice President George Conrades —

then head of IBM's U.S. operations — were widely seen as competing contenders to succeed him. When Conrades was stripped of his command, given a less powerful post and assigned to report to Armstrong two months ago, observers said they saw Armstrong as the successor designate.

"At this point, all bets are off at IBM," Frank Gens, an analyst at Technology Investment Strategies Corp. in Framingham, Mass., said last week.

Changing of the guard

At the December 1991 analysts' conference held by the IBM management committee to try to allay concerns about the reorganization, one question repeatedly asked was, "How can you create a new IBM with the old guard still in charge?"

"Whether intentionally or by accident," Gens said, Armstrong's defection on the heels of Conrades' demotion forces the firm to focus on a new guard.

Robert LaBant, who piloted the Application System/400 to prominence and was rewarded with Conrades' former job, was mentioned by several analysts as having successorship potential, as were recently appointed IBM Software Business Unit head Bernard Puckett and Personal Computer Business Unit President James Cannavino.

However, John B. Jones Jr., an analyst at Montgomery Securities, said, "Things are changing so fast that the guy who makes it to the corner office at IBM is likely to be a guy we haven't thought of — or maybe even haven't heard of yet."

Pen systems makers eye personal information

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — Application builders in the embryonic pen-based computer market are hoping familiarity will breed content when it comes to gaining mainstream corporate acceptance. Last week, two developers launched a pair of personal information manager packages that neatly duplicate the everyday paper appointment books they were designed to replace.

The introduction of Slate Corp.'s Daytimer Pen Scheduler and Pensoft Corp.'s Perspective at Pen Computing 1992 could significantly widen interest in pen machines, analysts said. Pen machines have thus far gained a limited corporate foothold, primarily in forms-based applications.

"People want to see pen-based extensions of what they're familiar with; they don't want to have to bend their work around the computer," said Mark Miller, an industrial analyst at The Boeing Co.'s Commercial Airplane Group.

Still, the potentially explosive pen-based computer market is likely to remain grounded until at least the middle of the year, its lift-off hampered by a lack of hardware and delays in getting out the two primary pen-based operating system environments: Go Corp.'s Penpoint and Microsoft Corp.'s Windows for Pen Computing platform, which will

arrive as part of Windows 3.1 at its introduction at Comdex/Spring '92 in early April.

While similar in concept, the Slate and Pensoft products differ in how they handle information. Slate's \$195 Daytimer Pen Scheduler was jointly developed with Day-Timers, Inc. and is an electronic version of that company's personal organizer, com-

plete with memo pad, "to-do" list, phone book and calendar. It will work with both the Go and Microsoft pen operating systems.

Pensoft's \$299 Perspective offers similar capabilities

but is built over an object-oriented database that links information in the various modules. It was designed for Penpoint.

They also differ in that Perspective offers complete or partial handwriting recognition, while Slate's product does not convert handwriting to text but instead uses on-screen ink capture.

Slate's move could signal a new trend in the pen-based application industry — one that emphasizes the tricky process of handwriting recognition.

However, according to Richard Shaffer, editor of "Computerletter," an industry newsletter, standards for sharing handwritten notes have yet to solidify, and ink consumes an inordinate amount of memory, suggesting that data compression schemes have to be a part of any realistic implementation on a portable machine.



Borland unleashes latest upgrade into spreadsheet arena

BY JAMES DALY
and CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. will unveil its latest entry in the fiercely competitive spreadsheet market this week when it announces a Quattro Pro upgrade that boasts improved graphics and printing enhancements for an added analytical edge.

"From what I've seen of 4.0, we've definitely got some users that are going to upgrade," said Clifford Cuellar, a computer technical specialist at the Washington State Department of Natural Resources in Olympia.

The release of Quattro Pro 4.0 marks the beginning of a one-two spreadsheet punch that Borland is expected to culminate in late spring with the rollout of Quattro Pro for Windows.

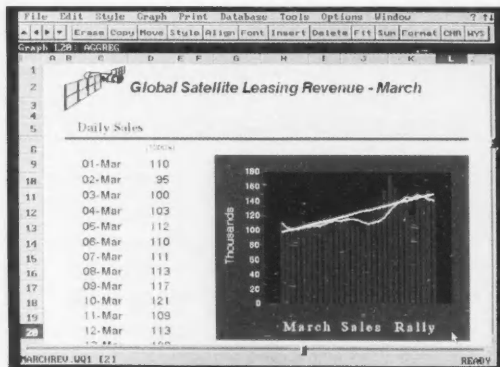
New features in the update include Speedbar, with which Cuellar said he was particularly impressed, wherein users can invoke frequently used spreadsheet commands through the single click of a button, in a similar fashion to Lotus Development Corp.'s SmartIcons in 1-2-3 for Windows. "A user can define a block and press a button and sum the block," Cuellar said.

Borland has also added Novell, Inc. Netware integration so Quattro Pro can automatically recognize local and network drives as well as perform automated server logging and drive mapping.

Another feature allows users to import Lotus' 1-2-3 what-you-see-is-what-you-get formats, while an optimizer allows users to build spreadsheet models that change variables until the specified goal is reached.

Quattro Pro 4.0 also includes additional zoom features as well as cell-formatting abilities and enhanced file tools.

Despite the slick update, Borland still faces big challenges in the marketplace — and in the courts. Cambridge, Mass.-based



Borland's Quattro Pro upgrade includes Speedbar, a feature that allows users to invoke frequently used spreadsheet commands through the single click of a button

Lotus has filed a copyright infringement suit against Borland, claiming that Quattro Pro infringes on its best-selling 1-2-3 spreadsheet.

Both parties are waiting for the judge's decision on three issues that will determine if a trial will take place: copyrightability of 1-2-3, substantial similarity between Quattro Pro and 1-2-3 and Borland's claims that Lotus had indicated Quattro Pro was acceptable and that it had waited too long to file suit.

However, Borland has continued to put resources into Quattro Pro. Last year, it announced a stripped-down version of its spreadsheet aimed squarely at the home and small business markets.

Version 4.0 will be offered at a suggested retail price of \$495. Current Quattro Pro users will be able to upgrade for \$79.95. A competitive upgrade from other spreadsheets, including Lotus 1-2-3, will cost \$99.95.

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NEWS SHORTS

It's a done deal

NCR Corp. completed its half-billion-dollar stock-for-stock merger with Teradata Corp. last week. The merged entity will carry the NCR name. William J. Eisenman, vice president of the NCR Large Computer Products Division, will assume responsibility for Teradata's development and manufacturing operations; Teradata Chairman/Chief Executive Officer Kenneth W. Simonds will retire after a transition period. The NCR/Teradata Joint Development Organization was renamed the NCR Torrey Pines Development Center.

Sequent president leaves firm

Sequent Computer Systems, Inc. President Scott Gibson resigned last week, citing the need to spend more time with his family. Gibson, 39, decided to leave in September 1990 but delayed doing so until the firm recovered from three quarterly losses in 1991. Sequent Chairman Casey Powell will become president and the firm's sole CEO. Gibson will stay on for a month, then leave Sequent; he will not retain his board seat.

HP gives HMO a shot in the arm

Pilgrim Health Care, Inc. last week became the first site in the nation to install a Hewlett-Packard Co. HP 3000 Series 980 symmetric multiprocessing computer. The three-CPU Model 300 machine was installed as an upgrade to an HP 3000 Series 950, said John Shea, manager of information systems at the \$300 million not-for-profit health maintenance organization near Boston. At the same time, Pilgrim added 20G bytes of new HP disk drives. The changeover means Pilgrim is now operating at about 40% of capacity vs. its previous 90% level.

ODA unwraps APIs

The Open Document Architecture (ODA) Consortium has announced programming interfaces designed to speed development of applications allowing electronic interchange of documents among disparate, remote computer systems. The group, consisting of six large systems vendors, said the interfaces will be included in a developer's tool kit slated to ship in the first half of 1993. The tool kit will be openly licensed. The technology has reportedly been submitted to standards bodies.

HP puts on a happy face

HP said its first-quarter 1992 profits jumped nearly 50% on a U.S. sales increase of 13% and international sales increase of 14%. Net earnings topped \$306 million for the quarter ended Jan. 31 vs. \$205 million in profits for the same period last year. Revenue climbed to \$3.9 billion from \$3.4 billion, with laser printer orders up sharply.

Short takes

Microsoft Corp. has asked the U.S. District Court in San Francisco to dismiss the lengthy copyright infringement suit brought against it in March 1988 by Apple Computer, Inc. (see related story page 37) . . . David A. Norman, founder and former CEO at Businessland, Inc., has surfaced as chairman of the board at Insight Development Corp. . . . Gateway 2000 is offering free software options with the purchase of an Intel Corp. 80386- or 1486-based computer. Users can choose from packages such as Borland International, Inc.'s Paradox and Microsoft's Excel, Word and Powerpoint . . . The North American ISDN Users' Forum and Bellcore will host a workshop in Huntsville, Ala., this week for manufacturers and developers committed to creating products that comply with National ISDN-1 . . . Microelectronics and Computer Technology Corp. has selected the Washington Institute of Technology to provide computer-assisted educational tools to promote enterprisewide integration. The Washington institute will develop computer models of enterprise integration . . . Sterling Software, Inc.'s Intelligence and Military Divisions won an estimated \$29 million, 56-month contract to provide Air Force Global Weather Central with operations, maintenance and technical services.

More news shorts on page 16

Users seek hub-centric control

UB management method preferred over Novell's NOS-oriented approach

BY ELISABETH HORWITT
CW STAFF

Recent Novell, Inc. and Ungermann-Bass, Inc. forays into local-area network management are forcing some customers to decide whether they want to manage their enterprise LAN installations from the network operating system or from the hub.

That the hub seems to be winning hands down at several UB/Novell shops does not bode well for Novell's current efforts to get recognized as a seller of enterprisewide rather than just workgroup LAN solutions, observers said.

"Novell isn't the glue for all of our equipment," said David Wetzel, a telecommunications engineer at Syntex Corp.

LAN management war

Last week, UB announced a distributed client/server version of its existing integrated LAN management platform, Netdirector. UB also announced an OEM deal with Protocols, Inc. that is said to give Netdirector the ability to monitor traffic and errors generated by a variety of popular LAN protocols.

Earlier this month, Novell announced its long-awaited integrated LAN management platform, Netware Management System [CW Feb. 10]. The distributed OS/2- or Windows-based system will handle a wide variety of LAN systems and components, through a combination of Simple Network Management Protocol (SNMP) agents and support from dozens of third-party vendors, Novell said.

Novell's recent entry into multivendor LAN management is just one of several tactics by which the vendor hopes to get taken seriously as an enterprisewide network vendor, said Barry Gilbert, a director at market researcher Computer Intelligence.

Novell's recent announcement of an intelligent hub component for Netware is another such tactic, as is its expected introduction of more viable corporate-wide naming and directory services, he added. "The network operating system vendors want to get into [the] wide-area arena to control end-to-end connectivity of all those islands," Gilbert said.

Battling prejudice

However, Novell may face an uphill battle if the reaction of certain network managers at UB/Novell shops proves typical. The managers said that while they might buy Netware Management System to manage Netware servers, they favored UB's Netdirector as their overall LAN

management system. Much of UB's edge derived from their perception that the vendor's Access/One hubs, far more than Netware servers, form the key-stone of their corporatwide LAN architectures.

"Netware servers are one

management of the other" vendor's LAN system, he added.

Bogart said he was "leaning toward Netdirector," but his ultimate choice would depend on which vendor offered a more powerful platform and superior capabilities.

"NOVELL ISN'T the glue for all of our equipment."

DAVID WETZEL
SYNTEX

component of many in our network, but we are very dependent on [UB's] Access/One hubs to link modem pools, hosts, minis and workstations," said Greg Parcell, a network management project manager at the Chicago Board of Trade. "We need all the tools Novell can give us, but for the big picture, I see Netdirector."

"I'll look at both [UB's and Novell's offerings], but management will probably let me buy just one," said Dennis Bogart, LAN manager at the Irvine Engineering Division of Fluor Daniel, Inc. "So I'll probably have to do some customization to integrate

UB enhancements

UB has been targeting the integrated LAN management market for more than a year now and expects to ship 1,000 Netdirectors by the end of this quarter, said UB's business unit leader, Didier Moretti.

Its new enhancement, Adaptive Internetwork Management, is said to allow users to distribute the management of one or more UB subnetworks out to local domain servers, which can do autonomous management or forward network alerts up to a central Netdirector system.

UB also announced that Netdirector will support Protocols' LAN monitoring system, which analyzes and troubleshoots a variety of popular LAN protocols on both Ethernet and Token Ring networks.

Initial support will be via the SNMP, with fuller integration into Netdirector's graphical user interface and database planned during the next year, company spokesmen said.

Different strokes

Novell's Netware Management System and the client/server version of UB's Netdirector are more alike than not:

• Platforms supported:

Novell: OS/2, Windows.
UB: OS/2 now, Unix to come this year.

• Standards supported:

Novell: SNMP now, the Open Software Foundation's Distributed Management Environment to come.
UB: Same.

• Architecture:

Novell: Distributed client/server, based on remote procedure calls.
UB: Same.

• LAN systems managed:

Novell: Network devices supporting Transmission Control Protocol/Internet Protocol and Novell's IPX; Netware servers; devices that support SNMP or Novell agents and interfaces.
UB: UB hubs; SNMP-compliant devices; monitoring of LAN protocols via Protocols Network Control Series.

• Open application programming interfaces:

Novell: Yes.
UB: No.

• Third-party supporters:

Novell: Dozens.
UB: Protocols.

• Pricing, availability:

Netware Management System: April; \$4,495.
Enhanced Netdirector: Second quarter; \$8,000 to \$19,500.

ITT Hartford seeks NCR's Cooperation

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — An ITT Hartford office here has migrated to the commercial version of Cooperation, NCR Corp.'s distributed office automation software environment, after working with beta code for six months.

"Ultimately, our business vision five years out is to replace mainframes with servers and terminals with intelligent workstations in the local offices," said Raymond L. Howell, assistant vice president of information management for the commercial market segment.

The Minneapolis office was chosen as the beta-test site because its business procedures were, as of June 1991, still steeped in manual processes. "Part of this is business re-engineering," said Howell, who is in charge of office automation for the 42 company locations nationwide that handle The Hartford's \$2.5 billion commercial property/casualty business. "The Minneapolis office is still set up functionally like it was in the 1950s."

Better performance

Howell said results from the Minneapolis office — the only one to deploy Cooperation to date — indicate the performance of Cooperation Version 1.0 is 25% better than that of the beta-test product and that NCR has successfully addressed most of the bugs in the beta-test product.

However, Howell conceded that while the dawn of an open, distributed, client/server architecture is visible in the distance, The Hartford and Cooperation have a way to travel before reaching that horizon.

For instance, while the 3270-type terminals that once linked the Minneapolis office to an IBM mainframe in The Hartford's home office are now gone, the 62 NCR 386SX personal computers that replaced them still use 3270 emulation to

reach those mainframes and virtually all of their applications.

The Minneapolis office is using Cooperation, Howell said, mainly for sending electronic mail between individuals and for its integrated calendaring system.

Still, Howell's information systems staff of 170 people has started to use some third-party tools, such as database development tools from Gupta Technologies, Inc. and Oracle Corp., under the Cooperation user interface.

Cooperation is derived from Hewlett-Packard Co.'s New Wave development environment, which is based on Microsoft

Corp.'s Windows.

Cooperation is the system software leg of NCR's Open Cooperative Computing (OCC) architecture, which it outlined in February 1990. The other two legs of the OCC triangle are a seven-level Unix hardware family (System 3000) and a networking strategy, Open Networking Environment.

Yet both Cooperation and the high-end models of the System 3000 computer line have been delayed. The commercial version of Cooperation, for example, was expected in the second half of last year but only officially began shipping to custom-

ers Jan. 24, according to an NCR spokeswoman. NCR has about 30 Cooperation beta-test sites outside the company.

The task of ensuring that OCC does not lose any more steam will fall to William T. O'Shea, a former AT&T Computer Systems executive. Last week, O'Shea was named head of a new organization that combines NCR's existing Network Products and Integrated Systems groups (see story below).

Meanwhile, some observers said NCR has made a subtle shift in its approach to Cooperation. "Originally, Cooperation was introduced as a set of software tools to allow organizations to develop group activities," said Steve Widen, a senior analyst at Workgroup Technologies, Inc. in Hampton, N.H.

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O'Shea moves

It has been a fast few months for William T. O'Shea.

Last July, the former vice president of Systems Marketing and Development at AT&T Computer Systems became the first AT&T executive appointed to a post at NCR following AT&T's acquisition of the Dayton, Ohio-based computer maker.

Last week, O'Shea advanced once again, becoming the head of a new organization that combines NCR's existing Network Products and Integrated Systems groups. In addition, he will oversee the following NCR divisions: Cooperative Computing Systems, Imaging Systems, Transaction Terminal Systems, Self-Service Systems and Printers.

O'Shea, 44, will report to NCR Chairman and Chief Executive Officer Gilbert P. Williamson.

In a related announcement, Tony Barrese was named vice president of the Network Products Division.

Netware 'burst mode' to up response time

BY JOANIE M. WEXLER
CW STAFF

PROVO, Utah — Novell, Inc. plans this week to simultaneously enter the multiprotocol router market and bolster response time between Netware clients and servers by 50% to 400%.

Novell's \$995 low-end router software is slated to ship with support for Novell IPX communications protocols, Internet Protocol and Apple Computer, Inc.'s Appletalk. Bundled into the package will be software in the form of a Netware Loadable Module (NLM) called "Burst Mode NLM," which Novell said boosts Netware response time

by at least 50% in the local area and up to 400% between local-area networks across wide-area links.

Burst Mode NLM has been in beta testing for several months [CW, Nov. 4, 1991] and is available to Netware 3.X customers.

One Netware user described Burst Mode NLM as "a preemptive strike" by Novell as the vendor "tries to get ahead of the WAN technology performance curve."

Bill Conley, manager of information system services at Loral

Aerospace Corp. in Newport Beach, Calif., said wide-area links have, to date, been the primary network bottlenecks. But

with technologies such as frame relay emerging, "the performance spotlight will probably shift to the LAN," Conley said.

Burst Mode NLM counters the original Netware scheme of sending out numerous small packets that must each be acknowledged before transmission of the next packet, which results in network bandwidth sitting idle. With Burst Mode, commu-

nicating devices gather packets of variable lengths, then "burst" them at full link speeds.

"It's like sending a whole chapter of a book at a time instead of page by page," explained Scott Jamar, product line manager at Novell's Internetworking Products Division.

The previous packet-by-packet scheme "translates into slower network performance, particularly on an Ethernet with lots of users" because of the LAN's contention access method, said Shirley Hunt, senior industry analyst at Dataquest, Inc. in San Jose, Calif. Having many retransmissions on a crowded Ethernet that is experiencing

numerous collisions magnifies the packet-by-packet acknowledgment issue, she said.

Router-wise, "There is a lot of pressure at the low end of the market," said Paul Callahan, a senior analyst of network strategies at Forrester Research, Inc. in Cambridge, Mass. "Companies are trying to cash in on branch-office networking with fewer protocols and scaled-down prices." Dataquest principal analyst Jerry McDowell asserted that "in the Novell customer base, Novell will certainly capture a percentage" of the low-end router market.

One outstanding issue is whether the Novell routers will interoperate with corporate router backbones, as they do not currently support standard inter-router protocols.

Intel claims protection from 850-plus viruses

BY MICHAEL ALEXANDER
CW STAFF

SANTA CLARA, Calif. — Intel Corp. last week introduced software that it said will help systems administrators safeguard Novell, Inc. Netware 3.1 local-area networks from viruses.

Computer viruses have reached epidemic proportions in corporate America — thanks in large part to the widespread use of LANs. From a single entry point into a network, a virus can course through a system within minutes, bringing down dozens, or even hundreds, of computers.

Intel's software package, Lanprotect, is a Netware Loadable Module that detects more than 850 viruses. It works by continuously intercepting every file that travels through the network and then scanning and comparing it with a library of virus patterns or signatures.

The company plans to regularly update Lanprotect's library of virus signatures to keep abreast of new viruses soon after they are introduced, said Brett Walker, Intel product manager. The signatures will be posted on a bulletin board system.

"Because it [provides] contin-

uous protection of the server, there is no chance of a virus getting onto your server because [it has] to come by way of a file," Walker said. "If you do that on a prescheduled or on demand basis, there's lots of opportunity for virus-laden files to get on your server."

Constant monitoring

If a virus is detected, the program isolates it in a private directory. Lanprotect makes a log of when the virus was detected, the file to which the virus is attached, point of entry, user identification and, in enterprise-wide environments, the network from which it originated.

This constant monitoring has little impact on system performance, said Glen Farrell, an analyst programmer at Firestone Textiles Co. in Woodstock, Ontario, and a Lanprotect beta tester. "It really doesn't add any amount of time to access files; it's less than 50 msec to scan a file," he said. "Doing a backup of 54,000 files adds only four minutes to the total time."

Lanprotect has a suggested retail price of \$995 per file server and will be available next month.

Michelangelo could unleash IS havoc

CONTINUED FROM PAGE 1

computer users may not be armed with the very latest versions of antivirus software capable of detecting and removing the virus.

The virus has already taken its toll on at least six vendors, who accidentally shipped products that were infected with the Michelangelo virus.

Earlier this month, Da Vinci Systems Corp. mailed 900 infected demonstration disks to its customers and resellers.

Last December, Leading Edge Products, Inc. shipped 500 computers with infected hard disks to its resellers. Last week, the company said it would bundle McAfee Associates' Viruscan antivirus software with all of its computers.

Danger exaggerated?

The peril posed by the Michelangelo virus is probably overblown, said David Stang, research director at the National Computer Security Association, an organization of users and vendors based in Washington, D.C.

"My intuition is that [Michelangelo accounts for] not more than 5% of infections right now," Stang said.

Only one in 1,000 machines are infected with viruses of any type; the Michelangelo accounts for only a fraction of those, Stang said.

His organization is receiving 20 calls a day from users clamoring for information about the virus. However, only one or two callers have reported actual infections, according to Stang.

The easy solution to the problem is to "buy antivirus software and install and use it properly," Stang added.

Virus trackers said they believe the Michelangelo virus first appeared in April 1991 in Sweden and the Netherlands.

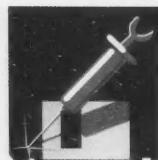
Since then, the virus has appeared at hundreds of sites

THE EASY solution to the problem is to "buy antivirus software and install and use it properly."

DAVID STANG
NATIONAL COMPUTER
SECURITY ASSOCIATION

throughout the U.S., leading some virus trackers to speculate that the virus is being spread deliberately.

Given its relative newness, rarity and unsophisticated design, it is a "statistical improbability" that the virus would spread so swiftly or widely on its own, Lefkon said.



Artful dodger

The Michelangelo virus has a trigger date of March 6 in any year and was designed to infect the boot sectors of floppy disks, the file allocation table (FAT) and master boot record (MBR) of hard disks.

When a system is booted from an infected diskette, the virus inserts itself into memory. Once resident, it overwrites the hard disk's FAT and MBR with random characters from system memory, thereby impairing the computer's ability to boot. The virus also destroys data by moving the original master boot record to a new location on the hard disk, according to the National Computer Security Association.

On diskettes, data is destroyed because the virus moves the original boot sector into a new location in the root directory and overwrites data in that sector. Diskettes inserted into a drive of an infected system are in turn infected during any read/write operation.

Recovering data destroyed by the virus can be difficult and time-consuming but it is not impossible, according to experts. The best defense is to scan disks for the virus before its trigger date, using the current version of any name-brand antivirus program that contains a signature of the Michelangelo. Also, backing up the hard disk is the best protection against losing data, experts said.

MICHAEL ALEXANDER

CORRECTIONS

The last sentence of "LAN security marching to smart hubs" [CW, Feb. 17, 1992] was cut off because of an error in the production cycle. The sentence should have read: One still unanswered question is how security features available on one or a few of a vendor's hub offerings will play with other members of the vendor's hub line without the technology.

A chart in *Computerworld's* Large Systems section last week failed to include one of Computer Associates International, Inc.'s products in a chart about the company's Unix initiative. The listing of database management software should have shown three products: CA-IDMS, CA-DB for Unix and CA-Datacom/Unix.

A story in the Feb. 17 issue on Banyan Systems, Inc. incorrectly conveyed information pertain-

ing to the company's new licensing program. All three new licensing packages — for five, 10 and 20 users — of its Vines network operating system are shipping.

A story in the January 27 issue misstated the storage capacity of Motorola, Inc.'s Newstream wireless receiver. It has a memory capacity of 32,000 characters and is capable of storing 56 messages at a maximum of 1,500 characters each.



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Netframe speeds servers with 50-MHz 486 chip

BY MICHAEL FITZGERALD
CW STAFF

MILPITAS, Calif. — Netframe Systems, Inc. last week jacked up the performance of its product line by adding two new servers designed around Intel Corp.'s 50-MHz 486 chip.

The NF450FT, available immediately, will cost \$69,950 for an Intel 50-MHz 486DX-based system with two I/O processors and a service processor, 32M bytes of error-correcting random-access memory and dual 380M-byte hard drives. The NF250FT, due out in March, will cost \$29,950 for the same system with

8M bytes of error-correcting RAM and less RAM and storage expandability.

These servers mark the first time Netframe has used the 50-MHz 486, Intel's highest performance chip. Netframe also claimed the servers are fault-tolerant, despite a lack of some features, such as dual power supplies and dual processors.

Non-Netframe users were lukewarm.

"I wouldn't be interested in it" because it will not be truly fault-tolerant, said Louis Kahn, network administrator for the Division of Immunization at the Centers for Disease Control in Atlanta.

Kahn said he had evaluated the Netframe NF400, an existing model of the

server, and found its performance disappointing. Each local-area network in his division uses two Compaq Computer Corp. Systempros in a primary and hot-backup configuration.

Joe Ivson, vice president of operations at U.S. Videotel, a regional on-line information services company in Houston, said he picked dual-processor Systempros over Netframe because Netframe was "too pricey." He said it still is.

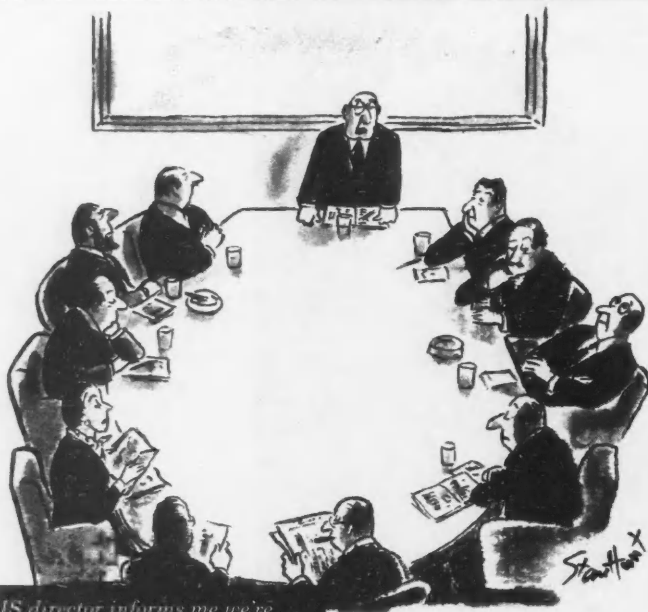
However, Jon Holman, director of technology at the law firm of Brobeck, Phleger & Harrison in San Francisco, which picked an NF400 over a Systempro and now has eight Netframes, said, "We

found Netframes actually cheaper than going the Systempro route."

Holman's firm consolidated 26 servers into six Netframes. He said not having to buy as many Netware licenses made the overall cost "not that much different from a PC-based solution."

"These upgrades are a very positive sign, but their technology has never been in question," said Thomas Willmott, vice president at Aberdeen Group in Boston. Willmott said Netframe suffers from weak distribution and weak demand.

Enzo Torresi, Netframe's president and chief executive officer, said the company is continuing to expand its relationships with value-added resellers and that 1992 will see demand for superservers increase dramatically.



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Interleaf targets document control

BY CAROL HILDEBRAND
CW STAFF

BOSTON — Interleaf, Inc. jumped into the document management market last week, planting stakes next to Adobe Systems, Inc.'s Carousel with its Worldview.

Worldview is targeted at large corporations with heavy document-processing needs. For example, Sprint International Communications Co. has integrated Worldview into its network management software.

"A click on the Help icon in the network management screen will call up context-specific Help," said Gain Buntin, manager of product documentation.

Announced at last week's Seybold Seminars '92 desktop publishing conference, Worldview can take text and graphics from virtually any source, and it also reformats, compresses and adds hyperlinks and a full text index to the document, according to Interleaf.

Worldview comes in two basic parts.

The first piece, Worldview Press, accepts documents from just about every major document format, including Postscript, Macdraw and Macpaint. Worldview Press will manipulate the documents by providing index generation for full-text retrieval, tables of contents and preparation for automatic hypertext links.

The second half of the package, Worldviewer, lets users browse through the ensuing electronic document.

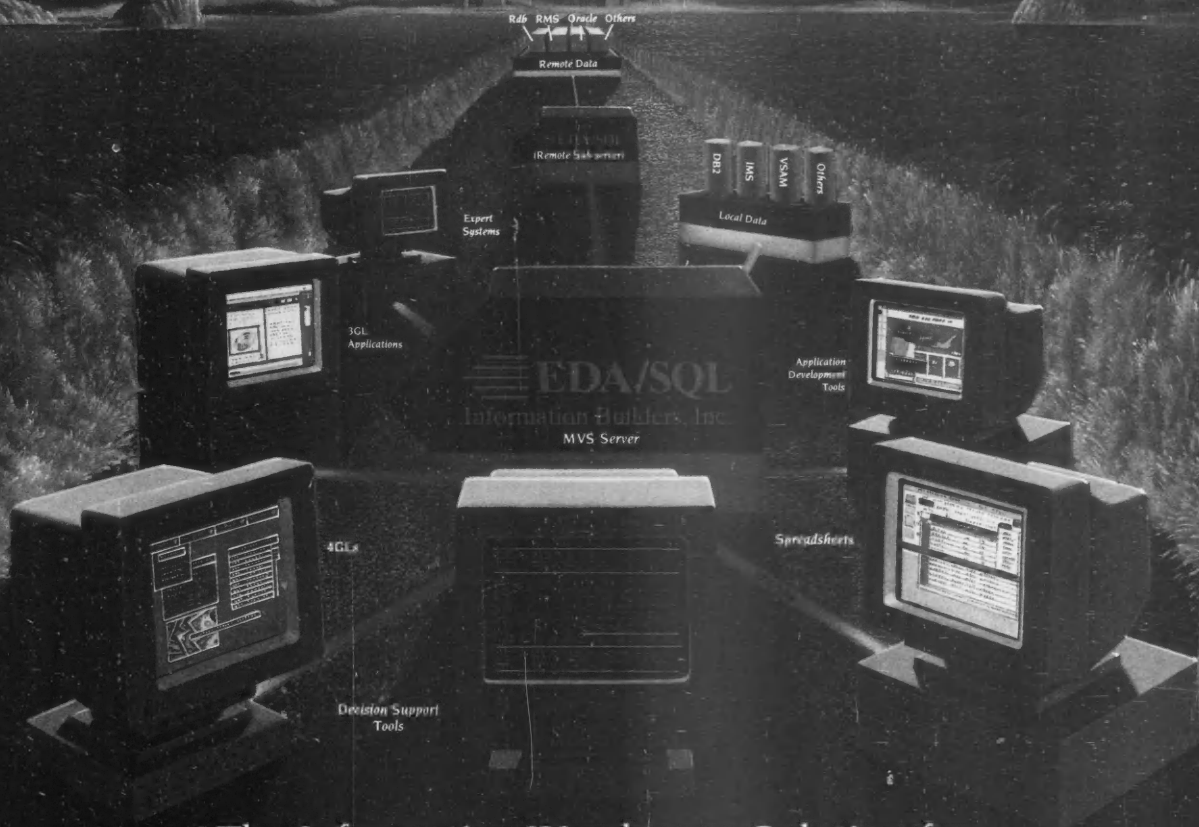
The company said voice annotation will be available further down the road. The ability to create hyperlinks will also be available to viewers in the future.

Worldviewer pricing begins at \$10, with an end-user license costing \$195. Worldview Press will be priced at \$10,000. Availability varies by platform.

Nancy Erskine, an analyst at Gartner Group, Inc., said she thought there was enough room for both Worldview and Carousel. "Adobe owns the distribution channel and share of mind, but Worldview has some different strengths," such as its search abilities. She added that she expects Carousel to appeal to those with less sophisticated requirements.

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IBM tries casual approach to development

BY ROSEMARY HAMILTON
CW STAFF

Walk into the IBM OS/2 facility in Boca Raton, Fla., and the only thing IBMish is the high level of security.

Programmers in casual clothes prefer conversational meetings to the formal marketing presentations for which IBM is so well known. The OS/2 team has been working virtually round-the-clock, and members joke about obtaining "visiting rights" for their families.

They are also gunning to finally score some points in the desktop operating systems war.

"Bill Gates talks about information at your fingertips, but we have information for your brain," said Michael Kogan, a lead OS/2 architect and principal designer for 32-bit OS/2. "I don't know about you, but I don't

want information in my hand — I want it in my head."

The team represents a radical shift for IBM. After IBM and Microsoft Corp. parted ways on OS/2 development, the company decided to alter its approach to building software.

"We couldn't have turned [OS/2] into what it is today" without the changes, said Shon Saliga, OS/2 development manager.

Saliga said IBM focused on a few hundred programmers at Boca Raton and assigned them to two main teams. One team worked on the base operating system while the other handled the additional functions, such as Presentation Manager, the Workplace Shell and device drivers. Developers in Austin, Texas, continued work

on the Extended Services function of OS/2.

Within the two main OS/2 groups in Boca Raton are several smaller teams that typically consist of approximately five developers. Each team owns a certain OS/2 component and guides it from start to finish.

Developers were also dispatched for the first time to customer sites so they could talk to real users. Another

first is a laboratory at the Boca Raton site designed to monitor end users.

Participants, who are found through temporary-help agencies, are videotaped working with the IBM software so developers can watch their reaction to the creations.

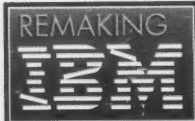
Recently, developers learned

from the videotapes that users were struggling with how to begin from within the Workplace Shell. The programmers then developed a "Start here" icon. When a user clicks on the icon, a basic introduction to Version 2.0 is provided, and users are then told how to proceed with a list of options for their next move.

This feature is not yet available in current beta-test code but will be part of the general availability release.

Before the new approach, programmers worked as part of one large staff and rarely stayed with programming assignments to their completion, Saliga said.

Kogan said the environment now encourages staffers to get involved and care about the outcome. "Before, it was rigid and formal," Kogan said. "I've been here six years and never talked to the press."



SLC: Innovative but comes at a cost

CONTINUED FROM PAGE 1

of Intel Corp.'s chips, for example.

Of course, users will have to pay a little more for IBM's inventiveness. The SLC is expected to cost more than the SX, with a base model system built around the chip listing for \$3,560. But IBM is banking that people will pay a modest premium for SLC-based Personal System/2s (desktops and notebooks) because they will offer a performance boost of about 80% over 20-MHz SL- and SX-based sys-

tems.

Users say the significant boost in performance is nice, but price remains paramount. "Performance will become more of an issue on the desktop," said W. B. Lovan, assistant buyer at Caterpillar, Inc. in Peoria, Ill., citing increased use of graphical user interfaces. "But that cost may be just a tad steep, though it's not an astronomical premium."

Amoco Corp. would like to increase its processor power, acknowledged John Chapman, a se-

nior technology consultant, who said he thinks IBM's pricing of the SLC boxes is reasonable.

Still, Chapman said users would decide if SLC-based machines offer the right mix of performance and price when compared to other Amoco-approved products, such as those from Dell Computer Corp.

Little differences

Despite IBM's hopes, analysts also downplayed the impact of the initial SLC.

"I don't think this will differentiate their product effectively," said Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing," a newsletter based in Boulder Creek, Calif. "They typically have not been a leader in performance, so this maybe catches them up with the pack but doesn't put them out ahead of it."

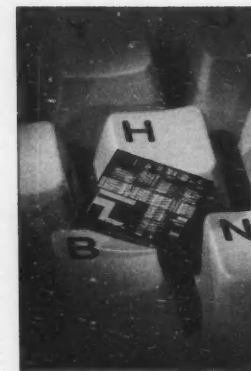
"It will help differentiate them if they can make SLC-based products more affordable. They need to get it to the low end, bring the pricing down," agreed Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass.

The SLC represents a hybrid of Intel 80386SL and i486 microprocessors that are fully compatible with Intel's designs. It has the command set of a 486SX, a special algorithm to quickly execute key instructions, the cache controller and power management features of Intel's 386SL and the on-board cache of a 486DX.

The cache provides the primary performance boost — the 20-MHz SLC outperforms 386

systems up to the level of a 33-MHz 386DX and the 16-MHz and 20-MHz 486SX chips. Advanced Micro Devices, Inc. said it expects, however, that its new 33-MHz 386SX clone will match the 20-MHz SLC in performance and beat it easily in price.

The SLC will, as of tomorrow's announcements, come



Thomas A. Wax
The SLC chip packs performance into a small package

standard on IBM's Model 57 and its new Model 56SLC. It is also expected to play a major role in IBM's portable rollouts later this year.

The next generation is on its way: SLC's project manager, Paul J. Ledak, senior engineer and microprocessor development manager at IBM's General Technology Division, has on his wall a poster-size plot of the "SLC II," and he keeps a carcass (a silicon wafer with just the bad chips left) of it in his drawer. IBM refuses to give a time frame for when this chip will ship in systems. It will offer at least twice the on-board cache of the current model and improved instruction sets.

Questions arise over OS/2 gear

FROM PAGE 1

cal leadership, may now find itself in the opposite position.

"Our biggest challenge isn't technical; it's a marketing one," said Shon Saliga, OS/2 development manager.

Even some customers attending an IBM-sponsored OS/2 migration workshop in West Palm Beach, Fla., last week were not completely sold on OS/2.

"Internally, we are not using OS/2," said Mark Caple, senior software engineer at ACT Financial in Birmingham, England. "I'm not saying never, but not now." Caple was one of several developers at IBM's OS/2 migration center, which is staffed by IBM employees from both the Boca Raton and Austin, Texas, development facilities.

Developers attend these five-day sessions, run biweekly, to port their applications to a native

EVEN SOME users at an IBM-sponsored OS/2 migration workshop were not completely sold on OS/2.

32-bit environment while receiving on-site help from IBM. Caple said he was at the workshop because his company has been marketing a stock trading application, currently Windows-based, and a major customer wants an OS/2 version of the software.

In an interview last week, Fernand Sarrazat, who was recently appointed assistant general manager of Personal Systems market development at IBM, acknowledged that a product cannot always sell on its quality alone. But, Sarrazat said, "It starts there. We have that, and it's the most essential piece."

Sarrazat declined to comment on speculation that IBM intends to actually give Version 2.0 away in some cases. He did say IBM will launch a "very aggressive merchandising campaign" as well as rely on the "IBM infrastructure" to push OS/2 through traditional channels.

As for Windows, Sarrazat said the IBM strategy does not call for direct comparisons or positioning against it.

"I think the momentum of Windows could actually help our offering," Sarrazat said. "We recognize Windows, and that's why we have a Windows capability in OS/2. I think we can ride the Windows momentum, too."

PC midrange revamp

The opening salvo from IBM's SLC arsenal will come tomorrow, when the company reveals a number of boxes that essentially revamp the midrange of its PS/2 line. Expected are the following, according to sources who have been briefed by IBM:

• **Model 56SLC** — The 56SLC will sport IBM's performance-boosting processor directly on the motherboard rather than as an upgrade option, which it is today. The three-bay, two-slot configuration offers 80M- and 160M-byte hard drive options. Users can choose between two other configurations: diskless Ethernet or Token Ring Lanstations. Pricing will start at \$3,560.

• **Model 57SLC** — Designed as a sister to the existing PS/2 Model 57SX, the 57SLC will start at \$3,995. Again, the machine will offer 80M- to 160M-byte hard-drive options with a four-bay, five-slot configuration.

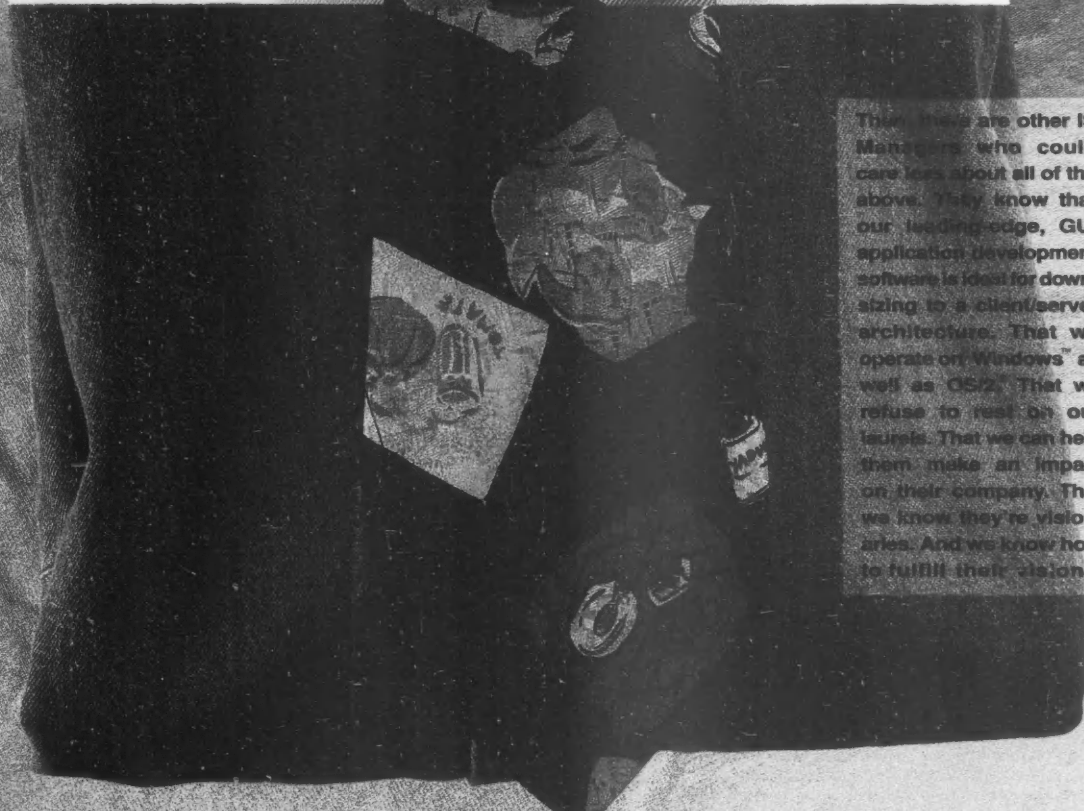
■ **Model 56SX** — Based on Intel's 20-MHz 386SX chip, the 56SX will be available in 40M- and 80M-byte hard drive configurations. Users can also choose either an Ethernet or Token Ring diskless Lanstations. Pricing for the product will start at \$2,745 — the same price point as the Model 55, which will be discontinued.

The SLC chip will reportedly nearly double a machine's processing speed. For example, a 57SLC will run Lotus Development Corp.'s 1-2-3 up to 88% percent faster than the 57SX. All the machines will have Extended Graphics Array standard, as well as small computer systems interfaces on the planar.

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Integrated services to drive LAN market

Part I of a two-part series on the future of network operating system software.

BY JIM NASH
CW STAFF

Distributed, integrated services — not the underlying network operating systems — are increasingly fueling the growth in the network market, according to analysts and information systems managers.

This trend, coupled with an expectation that desktop operating systems for IBM-compatible machines will begin to incorporate basic network services, such as print and file sharing, spells commoditization for network system software. It is also expected to lead to the eventual merger of network operating systems and desktop operating systems.

Instead of focusing on the network operating system, users will choose from a constellation of what they hope will be platform-independent network services — everything from security to connectivity to management. During the next three years, industry observers said, services will plug interchangeably into desktop operating systems sporting peer-to-peer file and print services.

The result, users and analysts agreed, will be less expensive networks on which applications

can be more easily developed. Common application programming interfaces will aid in this evolution.

If that openness takes hold, networking will see its next burst of acceptance, with linked computers becoming ubiquitous, predicted Richard Retin, senior technical analyst at Wells Fargo Bank in San Francisco.

He said he also sees the po-

ating system.

As users start to see that service — not the underlying network operating system — can best address their needs, they will begin demanding multivendor service support, said Roel Pieper, president and CEO of Unix System Laboratories, Inc.

"We certainly agree with that," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co. in San Francisco. Banyan, in particular, should focus on developing services, he said.

Microsoft Corp. and Banyan are starting to realign themselves and their products to take

advantage of growing user demand for superlative services, such as directory and security, which can be run on any major network in heterogeneous workplaces. Novell bought Digital Research, Inc. last year and is said to be molding Network and Digital's DR DOS into an operating system with file- and print-sharing capabilities.

Microsoft's anticipated Windows New Technology (NT) operating system is said to have some peer-to-peer networking capabilities built-in. Services now associated with the Redmond, Wash.-based company's LAN Manager network operating system will be sold as add-ons to Windows NT, according to Microsoft. Microsoft has said it will continue to sell OS/2-based LAN Manager in its entirety.

David Thatcher, product marketing manager for Microsoft's LAN Manager, denied reports that as much as 70% of LAN Manager's features would be available separately for add-on use to Windows NT.

Network systems becoming redundant with rise of Unix

BY JOANIE M. WEXLER
CW STAFF

As companies migrate to Unix and other operating systems that contain robust communications capabilities, the benefits of network operating system software, such as Novell, Inc.'s Netware and Microsoft Corp.'s LAN Manager, will probably diminish, users said.

Firms installing server software on Unix workstations, for example, are likely to wind up with a duplication of services because network operating systems do not add much to the functions inherent in Network File System (NFS), said Bill Riess, formerly a senior engineer in the information technology department at Chicago-based electric utility Commonwealth Edison Co.

NFS is a bundled Unix service that allows transparent access to files mounted anywhere on an internetwork. Riess said Commonwealth Edison plans to phase out its network operating systems as it moves to Unix.

Almost 100% clean

"There are a few idiosyncrasies with NFS, but 99.99% of your applications will work just fine under it," Riess said. He explained that users running Unix are probably also running Transmission Control Protocol/Internet Protocol (TCP/IP) on their personal computers.

Peter Storer, manager of information services at The Accord Corp., a Network shop in White Plains, N.Y., agreed. "Is it necessary to put a network operating system on Unix? Probably not."

Microsoft's manager of de-

veloper relations, Alistair Banks, acknowledged there is an "enormous overlap" in LAN Manager and Unix. He said, though, that protocols such as Novell's IPX and Microsoft's Netbeui are optimized for very fast local connections, while TCP/IP is slower but reaches farther.

Gluing DOS, DOS/Windows, Apple Computer, Inc. Macintosh, Unix and OS/2 clients together on one local-area network is another network operating system strength. William F. Ramsey, a senior analyst at Abbott Laboratories in Abbott Park, Ill., said, "We would probably need the LAN server software more for interoperability of disparate clients than for network services." Ramsey said he is considering the IBM RISC System/6000 as a server.

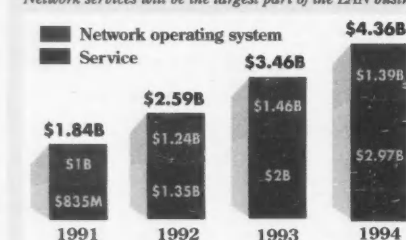
"Users are clamoring for a file server that can support multiple clients," said Dave Passmore, a partner at Ernst & Young's Network Strategies Group in Fairfax, Va. "Unix by itself doesn't necessarily give you that interoperability."

Passmore estimated that about 30% of LANs have a mixed client population.

New York-based brokerage firm Merrill Lynch & Co. has standardized on Unix for emerging trading applications and Network for support personnel [CW, Feb. 3]. Vincent G. Curatolo, vice president of distributed systems and services, said, "Obviously, if we run Unix and Novell from one machine, we eliminate a piece of hardware." Other than cost savings from hardware consolidation, however, he added, "I can't say yet what the benefits would be to running both."

Services segue

Network services will be the largest part of the LAN business



Source: BRG

CW Chart: Janell Genovese

tential for incredible network market growth in the short term if network operating systems begin to support other vendors' services. An example of this would be the rumored codevelopment effort by Novell and Banyan Systems, Inc. to put Banyan's Streetwork directory on Novell's Netware.

Banyan Chief Executive Officer David Mahoney refused recently to comment on the reports. If they are true, the effort would be the first major piece of evidence that network vendors are finally accepting the idea that network managers want to mix and match services independent of the underlying network oper-

Netware 3.2 may miss mark

CONTINUED FROM PAGE 1

It also is the feature most likely to encourage users of Novell's Netware Version 2.2 to upgrade to the vastly different Netware 3.X product line, managers agreed. Novell said it has ended development work on Version 2.2 but will continue to sell and support the software in its current form.

Due this fall, Netware 3.2 is expected to offer concurrent support for Netware and OS/2 on an Intel Corp. chip, along with a system-auditing module capable of tracking access to any network resource, according to two sources who said they have been briefed by Novell executives. The sources requested anonymity. Novell could not be reached for comment by press time.

Throwing both OS/2 and

Netware onto a single CPU would lower capital costs by reducing the number of personal computers that are typically required to run either Netware file services or OS/2-based databases.

Netware is basically a set of networking functions wrapped around DOS. Putting both OS/2 and Netware on the same chip means putting two operating systems on one CPU.

This approach would also reduce traffic on the network by eliminating requests between servers and databases.

Novell agreed to do this work last year in return for IBM's agreement to support and resell Netware, said Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn. As a side bene-

fit, the feature would provide an excellent pathway between OS/2 to Netware, Michnoff noted.

The sources said executives at the company have told them that putting OS/2 and Netware on the CPU will not significantly degrade performance.

However, network managers said they are not as interested in Novell's performance claims as they are in OS/2's uncertain future and how the combination might affect future Netware products.

"Many of us have given up hope of ever seeing [IBM's] OS/2 come to life," Goss said. Greater network connectivity is always welcome, he added, but connectivity to OS/2 is less of a priority.

Brian Hughes, a technical support manager at Idaho State University in Pocatello, Idaho, agreed. "Nobody here is jumping into OS/2 with any real zest. I

think Novell is just covering its bases," he said.

To the extent that MCI uses OS/2 — particularly to access a Lotus Development Corp. Notes

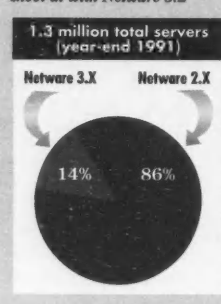
server on an OS/2 box — any improvement in linkage would be appreciated, Estridge said. Network Requester for OS/2 is the current method of connecting the two systems, but "it is a pain," Estridge said. If nothing else, "they have to clean up the [Requester] code."

Other network managers expressed concern that OS/2 alongside Netware might complicate or cripple existing and future functions, such as delivery of Netware System Fault Tolerance III, in which whole servers are mirrored.

Of greater interest to managers is software capable of auditing the way in which devices, services, files and other network objects are accessed. The two sources said Novell is likely to implement this software, referring to it as a system-auditing module offered as part of the new directory services.

Broad base

Novell has a large target to shoot at with Netware 3.2



Source: The Burton Group
CW Chart: Janell Genovese

Sun Expo: Users strive to handle Unix overload

BY MARYFRAN JOHNSON
CW STAFF

CHICAGO — Hard-core skills for managing diverse Unix networks got top billing on many user agendas at the Sun Open Systems Expo here last week, with the most popular conference sessions focusing on password security, large network monitoring, backup and integration strategies.

"As we move away from mainframes, people like me are finding out more about the systems administration aspects of open systems," said Ray Carlson, a mainframe programmer at Argonne National Laboratories in Argonne, Ill. "We want a core group at our central computing facility that is well-trained in dealing with these Unix networks."

Other users echoed similar concerns about the colliding worlds of the tradition-

al data center and the once-isolated Unix systems.

At Krause Publications, Inc. in Iola, Wis., for example, an IBM Application System/400 manages business and accounting functions, while a network of about 50 Sun Microsystems, Inc. workstations handles editing and publishing tasks. "We're starting to integrate the two now," said Dan Alfuth, a systems administrator at Krause. "In a sense, we've got all the equipment we need. We just want to take care of it all now and use it to the best advantage of the company."

Smoothing over the rough spots among different Unix variants was another

topic sparking discussion at the conference. At Siemens Gammasonics, Inc. in Des Plaines, Ill., incompatible file names between graphical user interfaces on Sun and Hewlett-Packard Co. Unix workstations have been an annoyance, said William Luthardt, a research scientist at the medical imaging equipment supplier. "The different flavors of Unix are still a problem," he noted.

The three-day Sun Expo attracted approximately 800 attendees on its opening day, with an anticipated crowd of 2,500. In the keynote address, Bruce Golden, director of commercial markets development at Sun, stressed that users will be

playing a larger role in future product development strategies at the workstation vendor. Golden later said the company is considering the formation of user advisory councils, but the idea is still in the "embryonic" stage.

A few disgruntled users are ready to give Sun a piece of their minds right now, however. "Sun's unbundling of the C compiler from the next release of the operating system [Solaris 2.0] is a major issue that a lot of people are irritated about," said Peter Salus, executive director of the Sun User Group based in Brookline, Mass.

The C language compiler is a crucial software tool for users who run public domain software or develop their own applications.

Third party adds to Vines control

BY ELISABETH HORWITT
CW STAFF

HOPKINTON, Mass. — Within the next 60 days, a key third party is expected to add some much-needed capabilities to Banyan Systems, Inc.'s Vines management platform.

Trellis, a charter member of Banyan's Independent Developers Assistant Program, plans to make major enhancements to its Expose Windows-based network management package, the company said last week.

While Banyan's own platform gives network managers a snapshot of what the network is doing "at a given minute in time, Expose allows you to get statistics" on what a server or group of servers has been doing "from point A to point B in time," a Banyan spokeswoman said.

Key among Trellis' planned announcements is a client/server version of Expose that will allow users to configure individual servers to take care of particular sub-networks or types of alarms, a Trellis spokesman said.

The new version will also collect a greater range of network statistics that will be made available by Vines 5.0, due to ship this spring.

Another planned Expose enhancement is a script for building "escalation procedures" that automatically pass a network alert to a succession of people if the initial contacts do not respond within a given period of time or if the problem escalates to a higher level of urgency. Notification can take place through electronic mail or pagers.

Bank of Tokyo Financial Corp. has been waiting eagerly for the alarm escalation and enhanced data reporting features, said Jonathan Oski, senior technical engineer at the bank. He added that he wanted to gather data on network errors and disk utilization.

"Banyan doesn't have anything comparable to this, and I don't expect them to," Oski said.

The new version of Expose will be priced at \$1,495 per server, which includes unlimited console support.

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NEWS SHORTS

Right back 'atcha

Responding to an Oct. 11, 1991, lawsuit filed by IBM, Seagate Technology, Inc. last week countercharged IBM with unfair business practices and restraint of employee mobility. IBM claimed that Peter Bonyhard, a former part-time IBM staff member now at Seagate, unlawfully took IBM technology.

Wang steps up patent pressure

The U.S. International Trade Commission has agreed to investigate the import of single in-line memory modules (SIMM) that infringe on two patents held by Wang Laboratories, Inc. Wang named seven Japanese companies in a recent complaint to the U.S. government, but the commission will examine the practices of all SIMM exporters, the commission said. Six months ago, a U.S. court ordered NEC Corp. and Toshiba Corp. to stop SIMM production and pay Wang \$3.3 million in damages.

Japanese firm buys into DEC Alpha

Digital Equipment Corp. said it will announce a deal tomorrow with Kubota Ltd. under which the Japanese steel and heavy-equipment manufacturer will use DEC's as-yet unreleased Alpha chip set, a DEC spokesman confirmed. No details were available as to Kubota's uses for the next-generation reduced instruction set computing chips.

4GL runs on AS/400

Progress Software Corp. is expected to announce today an Application System/400-compatible version of its fourth-generation language. Progress/400 runs under the AS/400's proprietary operating system and supports IBM's LU6.2 protocol. It can be used to develop client/server applications between AS/400 host machines and desktop computers running Microsoft Corp.'s Windows 3.0, OS/2 and IBM's AIX. Prices range from \$3,400 to \$122,400, depending on AS/400 used.

Microsoft vs. Kuwaitis, Part II

Despite earlier claims by Alalamiah Electronics Co. to the contrary, Microsoft said a jury ruled that it was innocent of charges of tortious interference, trade-secret violations and violation of a nondisclosure agreement between Microsoft and Alalamiah. Earlier, a federal court judge ruled that Microsoft did not engage in unfair competition with the plaintiff, nor was any confidential data related to any Alalamiah products sought or given to Microsoft following the hiring of two Alalamiah employees, Microsoft said.

Short takes

Delbert (Del) W. Yocam will join Oracle Corp.'s board of directors and its Finance and Audit Committee, effective March 2, Oracle said. Yocam, 48, was chief operating officer of Apple Computer, Inc. during the late 1980s. . . . **Phoenix Technologies Ltd.**'s Penbios basic I/O system will be used as the interface between Communication Intelligence Corp.'s Pendor operating environment and digitized pen technologies. . . . **Geoworks** has announced Pen/Geos, a pen-centric version of its object-oriented operating environment targeted at OEMs developing low-cost handheld computers costing less than \$500. . . . **IBM** last week announced Callpath/400 compatibility for two additional private branch exchanges: AT&T's Definity G3I and an NEC telephone switch available in Asia. . . . **Aquiline, Inc.** is shipping a 7.9-pound, 33-MHz 80386DX-based laptop with a 3½-in., 170M-byte hard drive along with a 5½-pound notebook based on Intel Corp.'s 25-MHz 386SL that comes with 60M-, 80M- or 120M-byte hard drives. . . . **Wang** sold a Boston building to the commonwealth of Massachusetts for an undisclosed sum rumored to be far below the \$10 million it spent to build the facility. . . . **Parcplace Systems** has released Objectworks/Smalltalk for the Hewlett-Packard Co. HP Model 710, its highest price/performance version of its object-oriented programming language to date. The new release is approximately 100 times faster than original Smalltalk systems and costs \$3,500.

Users laud speedier IBM AS/400 models

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — IBM last week introduced 13 new Application System/400 models that will improve the midrange line's performance by up to 70%.

Also unveiled were AS/400 versions of Wordperfect Corp.'s Wordperfect and IBM's own CICS, as well as a new release of the OS/400 operating system and software development tools under the AD/Cycle banner. At the same time, IBM introduced storage peripherals, including three rack-mounted versions of the 3490 tape drive and memory options.

John M. Thompson, general manager of IBM's Application Business Systems, denied that the new processors are meant to woo users of other IBM product lines.

"I'm not interested in taking business away from the ES/9000 line unless I can do something for the customer that they can't," he said.

Thompson maintained that the crossover between the midrange and the RISC System/6000 customer set and between the midrange and the Enterprise System/9000 product line is less than 10%. "My philosophy is that it is better to overlap and not miss markets than it is to have a gap and miss

opportunities. We're paying a small price in terms of overlap," he said.

For their part, customers seemed to welcome the growth path the new processors provided, although it does not necessarily translate into immediate purchase plans. Larry Wells, vice president of information systems at Southwestern Ohio Steel, Inc. in Hamilton, Ohio, said, "It's nice to know we can grow our model B60." He said he expects to upgrade "at some point." All B, C and D models are field-upgradable to the E models, which will be available on March 6, IBM said.

Going for great

More important to Wells in the short term, however, is the new operating system release's "save-while-active" feature that will allow users to back up their AS/400 data to tape without having to shut the machine down. "It's going to be great," Wells said. To do a complete backup now, he explained, the computer has to be shut down for four hours each week.

Version 2.2 of the operating system, which will include "save while active," is scheduled to be available in December. The latest release of OS/400, Version 2.1.1, is slated to be available on March 6, a month earlier than originally planned; it is required

for the E models, IBM said.

Value City Department Stores, Inc. in Columbus, Ohio, which has 58 stores nationwide, just upgraded to a D80 model six months ago.

"With the E90 sitting there, I can breathe easy that MIS won't be an obstacle to company growth," said Denis Fredrick, MIS director.

The E90 is now the top of the AS/400 line, with a three-way multiprocessor and 70% more performance than the D80. The E90 also marks IBM's first use of its 16M-bit dynamic random-access memory chip, which increases main memory capacity to 512M bytes, a boost of more than 30%. The 16M-bit chip will be used in other IBM products this year, the company said.

Also new on the hardware front is the 5494 Remote Control Unit that connects workstations running on IBM's Token Ring local-area network. A new 1G-byte, 3½-in. disk drive is also available for the low-end and midsize AS/400 models. Those same processors can now also use the 3995 optical disc, which had only been available for the larger AS/400 models.

Also unveiled were systems administration tools to manage and control all AS/400 software and hardware from one machine; a capacity-planning package; an enhanced version of SQL/400 that includes a new user interface to help users create queries; and a feature called Rumba/400, which allows users of Personal System/2s running Microsoft Corp.'s Windows to share data and applications stored in AS/400s.

Guglielmi to steer IBM/Apple venture

BY ROSEMARY HAMILTON
CW STAFF

SAN JOSE, Calif. — IBM and Apple Computer, Inc. are expected to announce today that

Joseph Guglielmi, most recently IBM's lead OS/2 executive, will head up Taligent, their object-oriented joint venture, according to industry observers.

IBM plans to fill Guglielmi's OS/2 post with Fernand Sarrazat, sources said.

Sarrazat joined the Personal Systems Division as an assistant general manager of personal systems market development in December, after leaving the defunct IBM Desktop Software Group.

The change comes just weeks before the expected shipment of OS/2 2.0; some said Sarrazat has been working closely on the OS/2

project and is ready to step in.

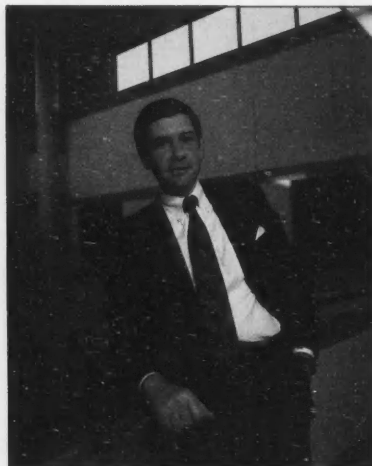
Observers said they expect Guglielmi's appointment at Taligent, which is developing an object-oriented operating system, to be well-received. He was be-

lieved to be a candidate for the job more than a month ago.

At the Windows and OS/2 Conference in mid-January, where Guglielmi was on hand to promote IBM's desktop operating system, he refused to comment on speculation about the Taligent job but did say, "I've personally been involved in setting up the company. There's progress being made, and there's a lot to do."

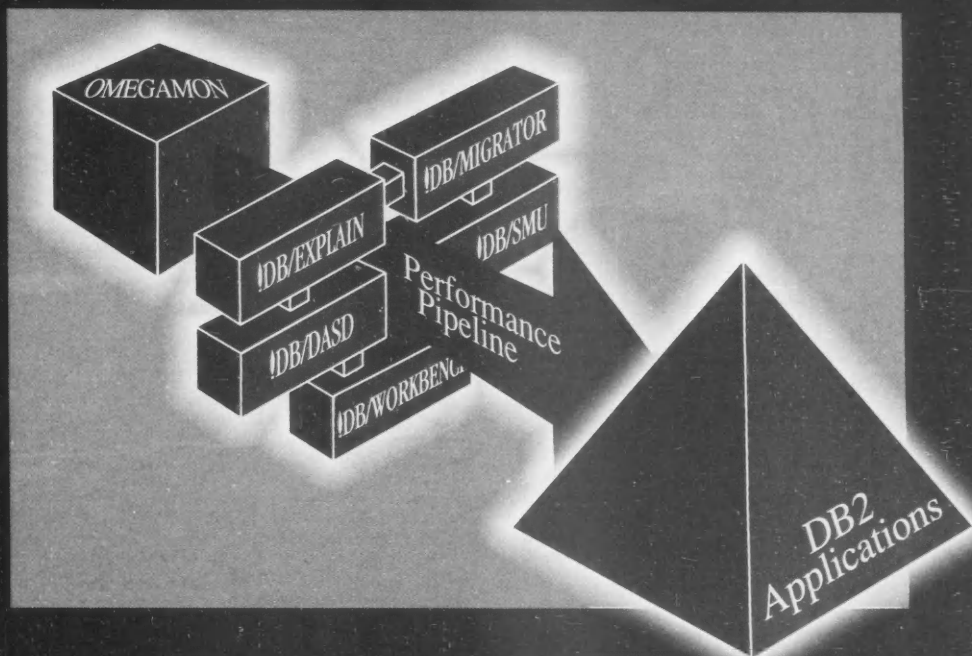
The longtime IBMer is apparently well-liked by the Apple camp and is considered a smooth marketer who can manage the start-up.

Tim Bajarin, president of consulting firm Creative Strategies Research International, Inc., said, "He was one of those pivotal people [at IBM] who worked with other companies. I think that's part of the reason he won the Apple people over."



IBM's Guglielmi, considered a smooth marketer, is a popular figure in the Apple camp

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**HEWLETT
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HP announces next-generation PA-RISC chip

BY MARYFRAN JOHNSON
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week flexed its muscles and started warming up for the next round of workstation wars by announcing its next-generation Precision Architecture-RISC microprocessor.

The superscalar PA-RISC 7100 chip, which will show up in new HP computer systems in late 1992, will reportedly deliver up to 50% more performance over current HP 9000 and 3000 systems.

Missing from HP's announcement were any prices or availability dates for

the new systems. Details about a promised upgrade path for current customers were also sketchy, although company officials said full compatibility is guaranteed with previous PA-RISC chips.

"Anything that gives us faster response time for people on the factory floor is welcome," said Jack Jeffers, quality assurance manager at Quaker Oats Co. in Jackson, Tenn., which uses an HP 9000 Series 800 multiuser machine to run a statistical process control system.

The next generation of PA-RISC is supposed to zip along at a clock speed doubled from the current 50 MHz to 100 MHz and a performance rating of 120

Specmarks. No official benchmark tests have verified the chip performance yet, however, company officials said.

HP now leads the industry with a 76-Specmark maximum performance rating on its HP 9000 series of workstations and servers. Yet the competition is growing at HP's heels.

Over the next several months, three new reduced instruction set computing chips will begin vying for market share: Mips Computer Systems, Inc.'s R4000, Digital Equipment Corp.'s Alpha and Sun Microsystems, Inc.'s Supersparc/Viking chip.

HP's new microprocessor will be

based on a single-chip design rather than its present dual-chip implementation. Shrinking the processing heart of the system down to one chip accomplishes two goals: It frees up additional space for memory cache and other features, and it cuts manufacturing costs.

"Everybody's got to do two things today: Up the clock rate and have a single-chip implementation," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "Having 100 MIPS on a chip is the benchmark for this year."

However, Gordon Kerr, senior vice president of MIS at Hyatt Hotels, Inc. in Chicago, noted, "The trick is not necessarily chip speed, but putting together a comprehensive system without bottle-necks or glaring deficiencies."

**"Scuba tanks are
all alike. Buy the cheapest
one you can find."**

Microsoft touts Windows tester

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Microsoft Corp. this week plans to unveil a tool that it claims will make creating and testing Windows applications far easier and less expensive than it has been in the past.

Microsoft Test for Windows is a Windows-based tool that allows users to record and create scripts that can reproduce mouse and keyboard input, trap and log errors both in Windows and the application, compare screen bit-maps and check the timing of selected aspects of an application, such as dialog boxes appearing.

"My general feeling is that it would be very helpful," said Dirk Baum, executive vice president of intelligent workstations at DHI Computing Service, Inc. in Provo, Utah. "One of the problems we run into is that there are so many available options that [Windows] is difficult to test."

Microsoft said one area where it hopes the product will perform well in is acceptance testing. Users could write suites of scripts intended to test new software packages for compatibility in common work environments without requiring someone to physically run the tests.

Michael Greene, quality assurance manager for Windows at Intel Corp. in Santa Clara, Calif., has been using the product for just such a purpose. Greene described the layers of software — DOS, Windows, network drivers, applications — in his configuration as a house of cards, with each new, upgraded or modified application having the potential to bring the house crashing down.

Using Test for Windows, he has developed scripts that can test common scenarios whenever a change is made to the network's software configuration, finding problems before they can affect users. Art Block, vice president and chief technical officer at Evernet Systems, Inc. in New York, pointed out that other products exist for testing Windows, such as the \$16,500 client/server-based Bridge Toolkit from Softbridge, Inc. in Cambridge, Mass., but they tend to be more expensive and complex than the Microsoft product.

Microsoft Test for Windows requires a system running Windows and is available for a list price of \$395.



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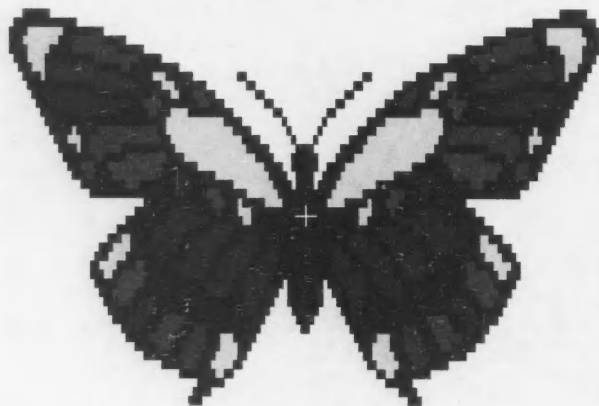
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Microsoft goes after U.S. DOS pirates

BY JAMES DALY
CW STAFF

BREA, Calif. — Microsoft Corp. last week led local police in an investigation that seized 3,000 bootleg copies of the DOS 5.0 operating system worth an estimated \$200,000 and nabbed two executives accused of selling them.

The warehouse raid on computer distributor Entech, Inc. marked the first time Microsoft has invoked criminal laws to combat software piracy in the U.S.

Such seizures have occurred regularly in the Far East, and industry analysts said

they expect to see increased vigilance used to address the growing problem of software piracy here. According to Business Software Alliance, piracy costs software makers as much as \$14 billion a year.

Arrested as a result of the raid were Entech President Chi Ming Robert Liu and sales manager Karl Richard Schlicht, who face prison sentences of up to a year. The company could be fined up to \$100,000. Both men were released on their own recognizance and are expected to appear in court next



month on charges of violating California's trademark law.

The seized copies were imitations of DOS 5.0 software made by Microsoft licensee BEC Computer GmbH, a German company with operations in Taiwan that sells DOS legitimately under the BEC

logo with its computer systems.

Entech, however, did not manufacture the counterfeit software. Microsoft and the investigators hope to use business records seized from Entech to trace the pirated software back to its source. Some

copies have probably made their way to users, Microsoft said.

Microsoft investigators said they were tipped off by the suspiciously low price — \$28 — offered by Entech, as well as the company's willingness to sell the operating system independently of computer hardware, a violation of the standard agreement between Microsoft and its licensees.

While the low price of counterfeit software may make it tempting to bargain-hungry users, Microsoft officials warn that users of bogus applications risk software viruses and a lack of product support from the legitimate manufacturer.

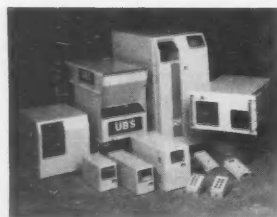
Users who suspect they have a bogus copy of DOS 5.0 can call Microsoft at (800) 662-6796.

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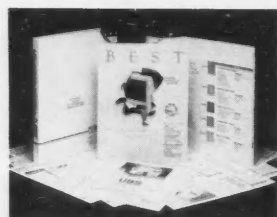
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Users debate I-CASE tools

BY KIM S. NASH
CW STAFF

SANTA CLARA, Calif. — Unrelenting recessionary pressures are causing many users to take a piecemeal approach to adopting computer-aided software engineering (CASE) tools, though some large shops remain convinced that integrated CASE kits are the only way to go.

Given the economy — and corporate perception that CASE is an unproven technology — most users are unwilling to invest in I-CASE tool kits, noted Paul Yamor, systems manager at Houston-based McDonnell Douglas Computer Systems Co. at the CASE World conference here last week.

The recession is forcing Yamor's division, which supports work on the NASA-sponsored space shuttle, to squeeze more life from existing applications, Yamor said. To do that, he is looking for individual modules to perform discrete functions, such as analysis, code testing and reverse engineering. "It's just more affordable," he said.

CASE pioneer and consultant Ed Yourdon noted that both I-CASE and the piecemeal approach to CASE carry pros and cons, but the latter method is gaining momentum. Indeed, of the relatively few new products unveiled at the show, the majority were from smaller vendors targeting specific development problems (see story page 63).

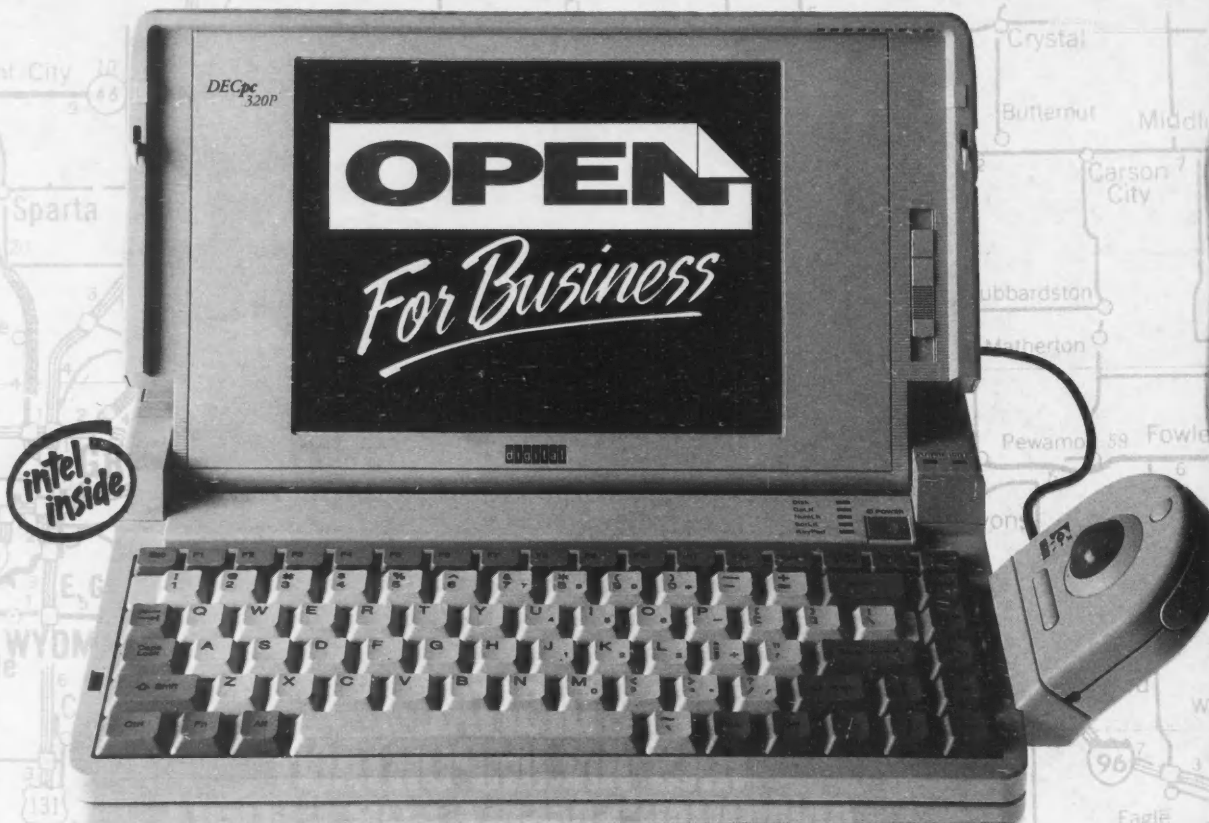
Tools for redesigning existing systems parts in order to make those applications easier to maintain make up a growing movement in the CASE market, Yourdon said. Several large vendors, including Texas Instruments, Inc. and Intersolv, Inc., recently introduced such tools or links to other companies' maintenance products. In addition, CGI Systems, Inc. announced an as-yet-unnamed personal computer-based product for studying old systems to improve maintenance.

Northrop Corp. is looking to do just that, said Jim Rheines, who manages CASE technology at the company's Hawthorne, Calif., office. "CASE is too pricey right now, but we've got to improve" current applications, he said.

Advocates of I-CASE, such as Esther Delurgio, vice president of information systems at Mitsubishi Motor Sales of America, Inc., believe in building applications with one vendor's tool workbench.



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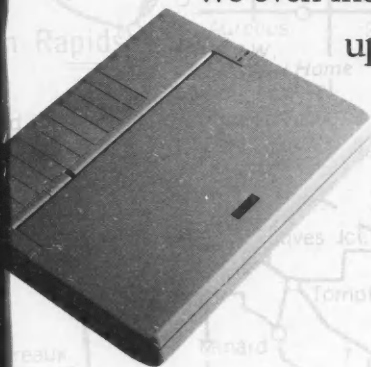
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Modem: 2400 bps Data
Keyboard: 84-key Keyboard
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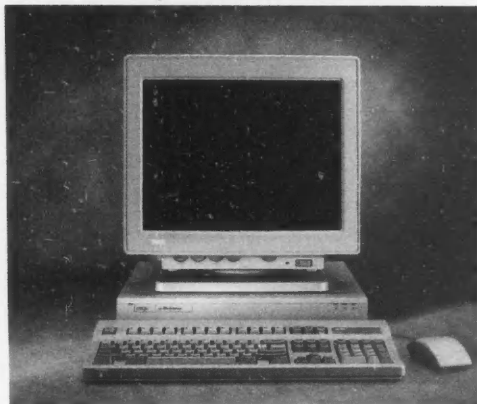


Includes:
Microprocessor: Intel i386sx running at 20MHz
Memory: 1MB, 80ns Memory Kit
Storage: 52MB IDE Hard Disk Drive
Resolution Mode: 1024 X 768 SVGA
Adapter
Display: 14" Multi-sync VGA Color
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Customization Worksheet

Your base system is a: ☐ 286 ☐ 386 ☐ 486 ☐ Other

How many applications will your PC(s) run in a typical workday? _____

What best describes the type of work the system will be used for?
(Check all that apply):

- | | | |
|----------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|
| <input type="checkbox"/> Word Processing | <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Scientific Research |
| <input type="checkbox"/> Order-entry | <input type="checkbox"/> Education | <input type="checkbox"/> Software Development |
| <input type="checkbox"/> Database (filing records) | <input type="checkbox"/> Design (CAD/CAM) | <input type="checkbox"/> E-Mail |
| <input type="checkbox"/> Financial Calculations | <input type="checkbox"/> Engineering | <input type="checkbox"/> Other industry-specific applications (please specify) |
| <input type="checkbox"/> Retail Store Management | <input type="checkbox"/> Industrial Process Control | |

How many people work in your group, department or small business?

- ☐ Less than 10 ☐ 10-20 ☐ 20-35 ☐ More

Is your operating system:

- ☐ DOS ☐ DOS with Windows ☐ OS/2 ☐ MAC ☐ UNIX™ ☐ Other

Which of the following graphics-oriented applications best describes your needs?
(Check all that apply)

- | | | |
|---------------------------------------------|--------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Realtime Modeling | <input type="checkbox"/> AutoCad |
| <input type="checkbox"/> CAD/CAM | <input type="checkbox"/> Animation | <input type="checkbox"/> Business Graphics |
| | <input type="checkbox"/> Image Processing | |

LAN Communication

How many PCs do you have installed? _____ From how many manufacturers? _____

What kinds of connections does your PC(s) require? (Check all that apply)

- ☐ Links with other PCs in the immediate surroundings
- ☐ Connection to the local area network (LAN) throughout a building
- ☐ A line to a host system in a remote location

What kind of media (cable) is used in your LANs today? _____

What is the networking software now being used in your company? _____

What kind of host system will your PC communicate with?

- ☐ DEC ☐ IBM ☐ Other _____

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Do you currently have a service contract(s) for your PCs? ☐ How many? _____

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ADVANCED TECHNOLOGY

TECH TALK

Lightening paper load

■ Drexler Technology Corp., based in Mountain View, Calif., has unveiled a document filing system called LaserCard File based on Drexler's 3M-byte optical memory card. The optical card can store up to 200 pages of text. The LaserCard File system includes an IBM-compatible personal computer, an optical card reader/writer, a fax machine for scanning documents, filing and retrieval software and 2,000 memory cards. The system is intended to be used off-line, distinct from a central filing system, and is thus more secure, the company said.

Personal videophone

■ A 9-in., high-resolution black and white monitor, an integrated video camera and support arm and a coder/decoder make up Colby System Corp.'s new Colbyvision personal videophone. The Palo Alto, Calif.-based company introduced the videophone last week. It transmits and receives 242-by-200-pixel black and white still-frame video pictures in 12 seconds over ordinary telephone lines, the company said. The videophone, priced at \$1,499, was designed for "personal videoconferencing," the company said. Colby said the videophone is compatible with a variety of video gear and can send images from any video camera or videocassette recorder.

A look at machine vision

■ The Machine Vision Association of the Society of Manufacturing Engineers (MVA/SME), based in Dearborn, Mich., has published the 1992 MVA/SME University/Industry Outreach Directory. The directory contains detailed profiles of technology groups and research centers at educational institutions that maintain outreach programs for the transfer of machine vision technology to the industry. It also includes information such as descriptions of works in progress and project budget and duration.

San Diego's Vislab: Heaven on earth

Supercomputer center researchers strive to break scientific visualization barriers

BY CLINTON WILDER
CW STAFF

San Diego may be known for its zoo and the America's Cup races, but many scientific researchers around the country think of it more as computer graphics heaven.

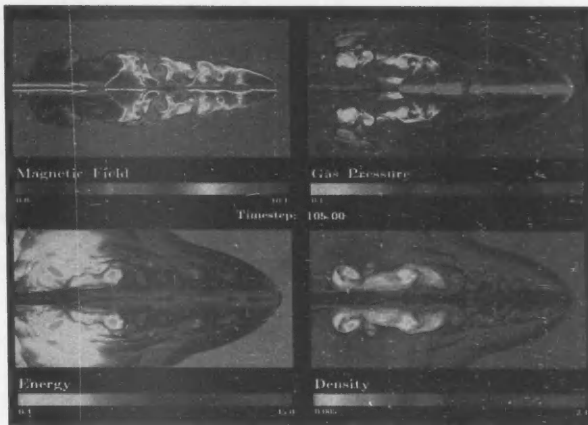
The Advanced Scientific Visualization Laboratory at the San Diego Supercomputer Center brings a complex stable of technology to bear on graphic representations of complex scientific research. The Vislab, as it is known, serves researchers at its University of California at San Diego (UCSD) location and in 44 states via the nationwide Transmission Control Protocol/Internet Protocol-based Internet and Bitnet networks. It is funded by the National Science Foundation (NSF) and the state of California.

"The bottom line here is science," said Mike Bailey, a UCSD adjunct professor who manages the Vislab. "With scientific visualization, we create more insight into the way things happen."

Number crunchers

Researchers at the Vislab can harness the raw number-crunching power of the center's supercomputers, then display and manipulate their results on top-of-the-line workstations from Silicon Graphics, Inc. and other vendors. The Vislab supercomputers include a Cray Research, Inc. Y-MP8/864 with 2.7 billion floating-point operations per second and two parallel supercomputers, an Intel Corp. iPSC/860 and an NCube 2 from NCube Corp.

The computing projects visualized at the lab include the California Department of Water Resources' simulation of pollution flows in San Francisco Bay and a UCSD professor's simulation of earthquake effects on different building designs. A breakthrough in organic chemistry research into protein structures using Vislab graphics was featured in a cover story in *Science* magazine last year.



San Diego Supercomputer Center

Vislab's supercomputers enable researchers to visualize and manipulate graphic representations of complex scientific research

But the Vislab does more than supply resources — it develops applications, connectivity tools and utilities to break new barriers in the scientific visualization process. Acting a bit like systems integrators, Bailey and his highly technical staff of 10 (half of whom work part time) have created image conversion tools to help deal with the wide variety of platforms that researchers may be using.

Image Tools 2.0, released last October, allows network users to access the Vislab's output devices via hosts from Cray, Silicon Graphics, IBM, Digital Equipment Corp., Sun Microsystems, Inc., Next, Inc., Alliant Computer Systems Corp. and Stardent Computer, Inc. "We really emphasize connectivity," Bailey said.

The Vislab has connected a wide variety of graphic output devices: color laser printers, digital film recorders and devices that produce transparencies, Polaroid prints and VHS videotapes. Video images can also be projected on a large screen for group viewing and discussion. Coordinating all the

output devices is an Alliant FX 2800 with 8G bytes of storage, which Bailey calls the "visualization server."

Mixing disciplines

Not content with sight alone, the Vislab also contains an audio lab where sound engineers produce computer-synthesized soundtracks. "We are very interdisciplinary here, with programmers mixing with scientists mixing with artists," Bailey said. "It's like pieces of a puzzle."

"You have to be interdisciplinary," added Dave Nadeau, a visualization specialist in the audio lab. "You have to see the big picture to make it all happen."

The lab also has an industrial partners program, allowing researchers from member firms such as American Cyanamid Corp. and McDonnell Douglas Corp. to take advantage of the technology. But because of its NSF funding, the lab's main charter is scientific advancement. "If there's one thing the U.S. needs right now, it's a scientific edge," Bailey said.

Bell Labs steps into fiber transmission future

BY MICHAEL ALEXANDER
CW STAFF

Scientists at AT&T Bell Laboratories have developed a technique to upgrade existing low-capacity, optical-fiber transmission systems that would permit broadband services and the simultaneous transmission of high-resolution video, digital audio and data.

The scientists have devised an experimental network that demonstrates the feasibility of providing broadband service for a fiber network engineered for "plain old telephone service" by

changing equipment on the fiber ends.

The experimental system would make it possible to transmit a wide variety of futuristic services to homes and offices, said Peter Bohn, supervisor of the loop systems planning department at Bell Labs. "One can envision such capabilities as electronic encyclopedias, shopping catalogs, travel and dining services, banking and more being brought to the home."

Traditional narrowband fiber systems use a fiber-to-the-curb architecture with one or two transmission fibers connecting a telephone central office to a neighborhood equipment

pedestal that serves four to 24 customers. These systems typically provide bidirectional low-speed voice and data transport at 64K bit/sec.

The experimental system uses an optical star coupler at the pedestal. It provides service to and from subscribers over a single fiber of the same type used in current low-speed, fiber-to-the-pedestal systems. The system combines wavelengths of light to carry multiple transmissions at the same time. Bell Labs researchers developed an experimental network capable of transmitting at 622M bit/sec. outbound and 155.5M bit/sec. inbound.

EDITORIAL

CIO swan song

If you're worried that CIO really does stand for "Career Is Over," then last week's front page story on how some companies are decentralizing their CIO function out of existence is not welcome news. The story focused on four companies — none of them lightweights in their industries — that have decided that, when it comes to information systems, no heads are better than one. Centralized corporate IS, they found, was incompatible with a decentralized business strategy.


Is this bad for IS managers? It depends on how you look at it. For those who envision themselves as one day presiding over an empire of systems programmers, computer operators and data-entry clerks, it's certainly not encouraging. But it shouldn't be surprising in light of the havoc that budget cuts have wreaked on IS spending during the last couple of years.

If you envision the future of the IS function as a process of weaving it deeper and deeper into the corporate fabric, there's a silver lining here. For one thing, decentralization means dispersion, and dispersed functions are more difficult to out-source. For another, an IS operation that's spread around creates lots of mini opportunities for people to run their own shows.

Computerworld's parent company got rid of its corporate IS function several years ago as part of an aggressive strategy to distribute decision-making responsibilities to the lowest possible level. The result is dozens of small operating units, each with control over its own computing destiny. It's that kind of local control that's enabled this newspaper, for example, to design a new client/server production system, and our sister publication, *Macworld*, to generate its pages on Macintosh desktop publishing software.

In decentralizing, you could argue that we've limited career paths for our IS staff, and perhaps that's true. But the structure has also given these IS pros the opportunity to experiment with leading-edge technologies, become experts in Novell networking or build Macintosh publishing systems from scratch without suffering through layers of corporate bureaucracy. When it comes to developing marketable skills, you can't beat it.

The concept of CIO with the big salary and oak desk was appropriate in the go-go '80s, but it is considerably less appealing in the oh-oh '90s. With the new business mandate to reduce overhead and quicken turnaround times, companies are finding themselves forced into decentralization whether they're ready or not. For the budding CIO, that means asking some questions: Is this company in deep weeds competitively? Is the CEO nearing retirement age? Are shareholders clamoring for a change? Do users see the IS staff as a bunch of clowns? If the answer is yes, you'd better go build your empire somewhere else.



Paul Gillin, Executive Editor



LETTERS TO THE EDITOR

Viral thrill seekers

Regarding "Challenge, notoriety cited as impetus for virus developers" [CW, Feb. 10], how can these hackers see themselves as not responsible for how their viruses are used?

If you deliberately leave a weapon in a public place, complete with instructions on how to use it, you are as responsible as those who actually use it. Depositing a virus on a bulletin board is inviting use, and when code is designed to disrupt the normal operations of computer systems, there can be little doubt as to what the virus would be used for.

The hackers feel their malicious image is not fair. Neither is having to be constantly alert for potential viruses because someone enjoys the thrill of writing one. My sympathy is more for those of us who have to watch for and clean up after their creations.

Dolores Berlanga Fierro
Pine Manor College
Chestnut Hill, Mass.

Mediation keeps disputes private

I am writing in reference to Joel Gilman's article, "The right ways to cut costs" [CW, Dec. 23, 1991/Jan. 2, 1992].

My own observations as independent legal counsel for high-tech companies is that mediation, not arbitration, is the better way to resolve business disputes, especially for small and midsize companies. Mediation is quick, less costly (lawyers are generally not required) and most important, it is confidential.

I have included a mediation clause in all contracts and agree-

ments that my clients enter into. I would also like to point out that alternative dispute resolution (ADR) is gaining momentum in the U.S. and, through the efforts of the Center for Public Resources (CPR), a New York-based nonprofit organization, more than 150 major U.S. law firms and 600 major Fortune 1,000 companies have endorsed ADR through CPR's efforts.

Joseph Valof Esq.
Natick, Mass.

Stop meddling

Gary Anthes' case for increased federal intervention in the U.S. economy is a masterpiece of sloppy thinking ["Policy and free-market status," CW, Jan. 20]. On examination, the three "trends" that Anthes cites to support his argument for more government meddling reveal a need for less of it.

The fact that other governments manipulate markets doesn't make a case for doing the same in the U.S. Also, Western Europe is about to pay the price for massive government intervention in its economic affairs. Western Europe's economies are about to be done in by the blatantly protectionist programs of the European Community.

Second, commercial spin-offs from quirky military technology have been few and far between. Instead, the U.S.' overemphasis on military research and development has drawn talent and dollars away from commercial R&D.

Third, the "near demise of private venture capital for high-technology start-ups" is a gross exaggeration. The scarcity of investment funds is largely because of punitive tax treatment of capital gains and the Treasury

Department's borrowing to finance the federal deficit.

Take another look at recent history: It is not free enterprise that is being overtaken by events; it is government-managed economies that have run their course.

Dave Nelson
Garmisch-Partenkirchen
Germany

Achieving harmony requires respect

Concerning "Getting to know U(sers)" [CW, Jan. 27], even though the author attempted objectivity, his information systems bias showed through. I could not sympathize with IS on any of the situations!

Although the IS position may have been justified in several cases, the responses to the user concerns were too curt and self-satisfying to warrant much sympathy.

Until IS organizations understand that IS is the supplier and the user is the customer who should be treated with respect, the desired harmonious environment will never be achieved.

J. T. Kelly
Information Resource
Management
Grumman Corp.
Bethpage, N.Y.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

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Breaking a barrier to trade

H. P. NEWQUIST



It's Japan-bashing time again here in the U.S. of A. Before we get too carried away with nationalistic fervor, however, we should probably think about how our own ethnocentricity is hurting our trade prospects.

When you buy Japanese products in the U.S., they have English manuals. They may not be very good English manuals, but at least you can read them. On the other hand, a large percentage of U.S. companies attempting to sell their products in Japan don't bother to offer Japanese language versions of their documentation, leaving the work of translation to either Pacific Rim trading partners or the end user.

As the biggest and best developer of software in the world, the U.S. could be using its software prowess to make translation of product documentation cheaper and easier for companies selling into foreign markets. We could be, but we aren't.

No great shakes

The Japanese and European communities are already scrambling to get their computers to do much of their export translation for them via machine translation. The U.S., on the other

hand, has a relatively limited presence in this field, consisting primarily of five very small private companies.

IBM keeps claiming to be ready to jump into the computerized translation business, but we've heard that line somewhere before.

The Japanese are spending heavily for research and development in machine translation.

database translator that allows users with no knowledge of Japanese to tap into a variety of technical databases in Japan, inputting English commands and retrieving translated information in about 80 seconds.

In addition, the Japanese are working on a 10-year project to have communications signals, such as telephone and telex, automatically translated into the



Stuart Goldenberg

In 1991, Japan's ATR, Inc. received funding from more than 100 companies, research groups and government organizations to begin developing a device that combines voice recognition and machine translation to produce English from spoken Japanese.

Fujitsu, Mitsubishi, NEC and Sharp also have commercial products that are either under development or are already available in the Japanese market. Fujitsu has developed an on-line

language of the signal recipient.

Not all the activity is in Japan. Europe is also several leagues ahead of the U.S., with a number of private companies and several government-sponsored projects attacking machine translation.

The most notable government-sponsored effort is the Eurotra project, which is funded by the European Economic Community. Eurotra's goal is to develop a multilingual system that can perform translation between

the languages of any two Common Market countries. This project began in 1985, and there are currently 12 countries and close to 100 researchers involved. Plans call for a working prototype in the next two years.

In the meantime, Siemens AG, the large German firm, claims to have developed a multilingual, "context understanding" system that can translate up to 200 pages a day.

Behind the eight ball

By contrast, the machine translation business in the U.S. hasn't advanced much since the early 1970s.

Some progress has been made recently at places such as Carnegie Mellon University, which has an intensive project under way, but most of the commercial development was killed off by a 1966 National Science Foundation (NSF) report, which said there was little or no future for machine translation.

It is clear now that the NSF was wrong. The commercial potential for this technology is huge.

Given the fact of an increasingly global economy, there is no excuse for the U.S. computer industry's failure to propagate the use of computers to translate documentation — for its own good and that of other exporting industries.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Self-service software: An idea whose time has come

LOUIS FRIED



The economics of business have become very clear. Wherever possible, products and services must be redesigned to have the customer perform as much of the labor-intensive sales and after-sales work as possible.

Fuel companies got the message a long time ago. As the cost of labor increased, "service stations" gradually converted to "gas stations" with self-service pumps. Today, the booming catalog sales industry has made sales clerks out of its customers.

Self-service in the computing field actually has a long history. Since the advent of operating systems in the early 1960s, vendors have required their customers to maintain expensive systems programming staffs to ensure that their software products would continue to perform. More recently, with shrink-wrapped software for PCs, the

load of training and support has again been shifted from the manufacturer to the customer.

Nevertheless, software products in both the systems software and the application software domains continue to require significant effort and cost in sales and after-sales support. Vendors have to continually train and retrain field personnel. Configuration and customization require major expenditures. After-sales support is often intensive. The vendor incurs the costs of administration, geographically dispersed offices and all the overhead associated with field support.

On top of all this, customers are often dissatisfied with field support, customization projects and other aspects of after-sales relationships.

Do it yourself

It's about time for self-service software. And given the array of existing tools and emerging technology, it is possible to build software that can be easily customized by the buyer to meet the

unique needs of his company.

Systems software provides a marvelous opportunity. For example, expert systems are clearly capable of constructing a system generator that would configure and load an operating system based on a description of the hardware configuration. The description would not require the expertise of a systems programmer but could be compiled by a senior computer operator.

The next step is to build self-identifying "nodes" into each connectable module or device. The system generator could then poll every connection and ask for the identity of the connected device... thus leading to an automatic systems generator.

Application software presents a greater challenge but one not beyond the bounds of technological capability.

Consider the combined capabilities of relational DBMSs, OOP, high-level CASE tools, data dictionaries/repositories, GUIs, automated testing tools and natural language query systems. Application suites built with these tools may readily provide all the basic building blocks needed to develop sophisticated applications with the output reports or interface screens easily specified by the user.

Furthermore, expert systems can be used to guide the design and configuration effort, display and explain options and support the interfacing of new application packages to existing applications or databases.

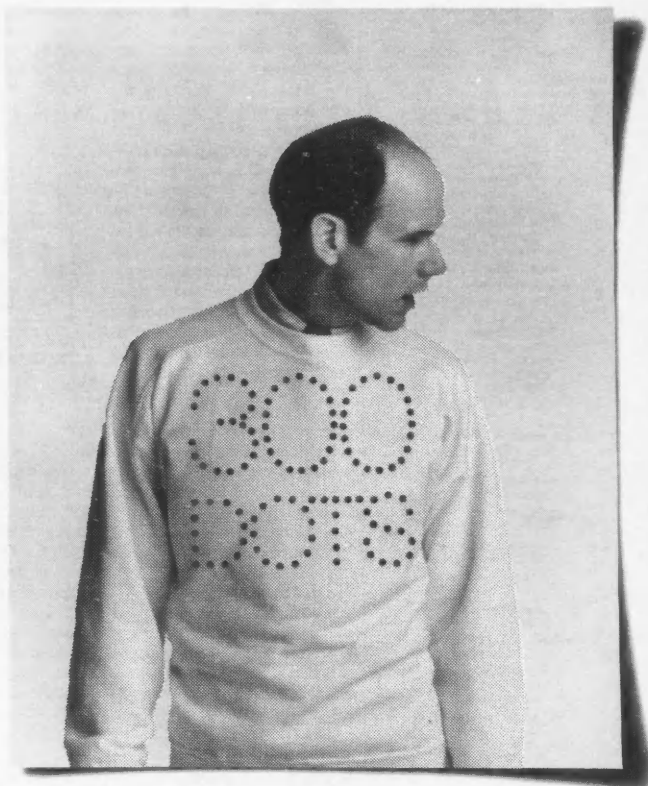
Users who know their business and are skilled enough to manipulate PC spreadsheets should be capable of customizing application packages. Certainly, systems analysts should be able to customize application packages without the need for traditional programming.

The current drive toward downsizing and the increasing use of client/server architectures implies that many of today's mainframe-oriented application packages will soon be at odds with the physical architectures being installed by users. A new generation of application packages is going to be needed by vendors if they intend to remain competitive. What better opportunity to design self-service software and thereby reduce operating costs and increase buyer satisfaction?

Fried is vice president of information technology consulting at SRI International in Menlo Park, Calif., with responsibility for worldwide information technology consulting activities.

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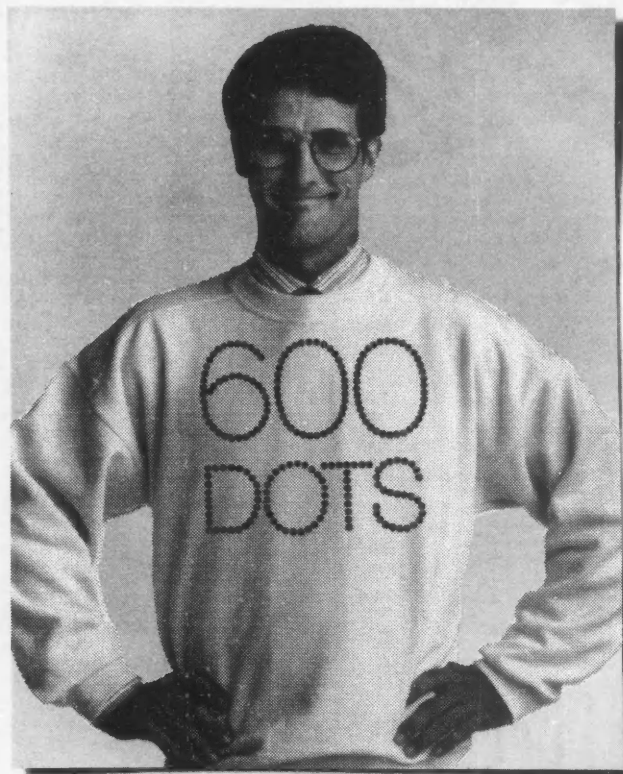


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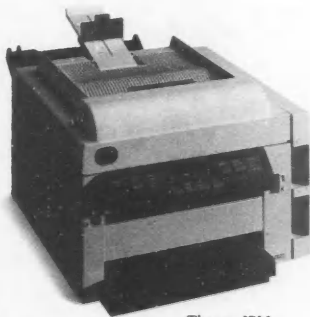


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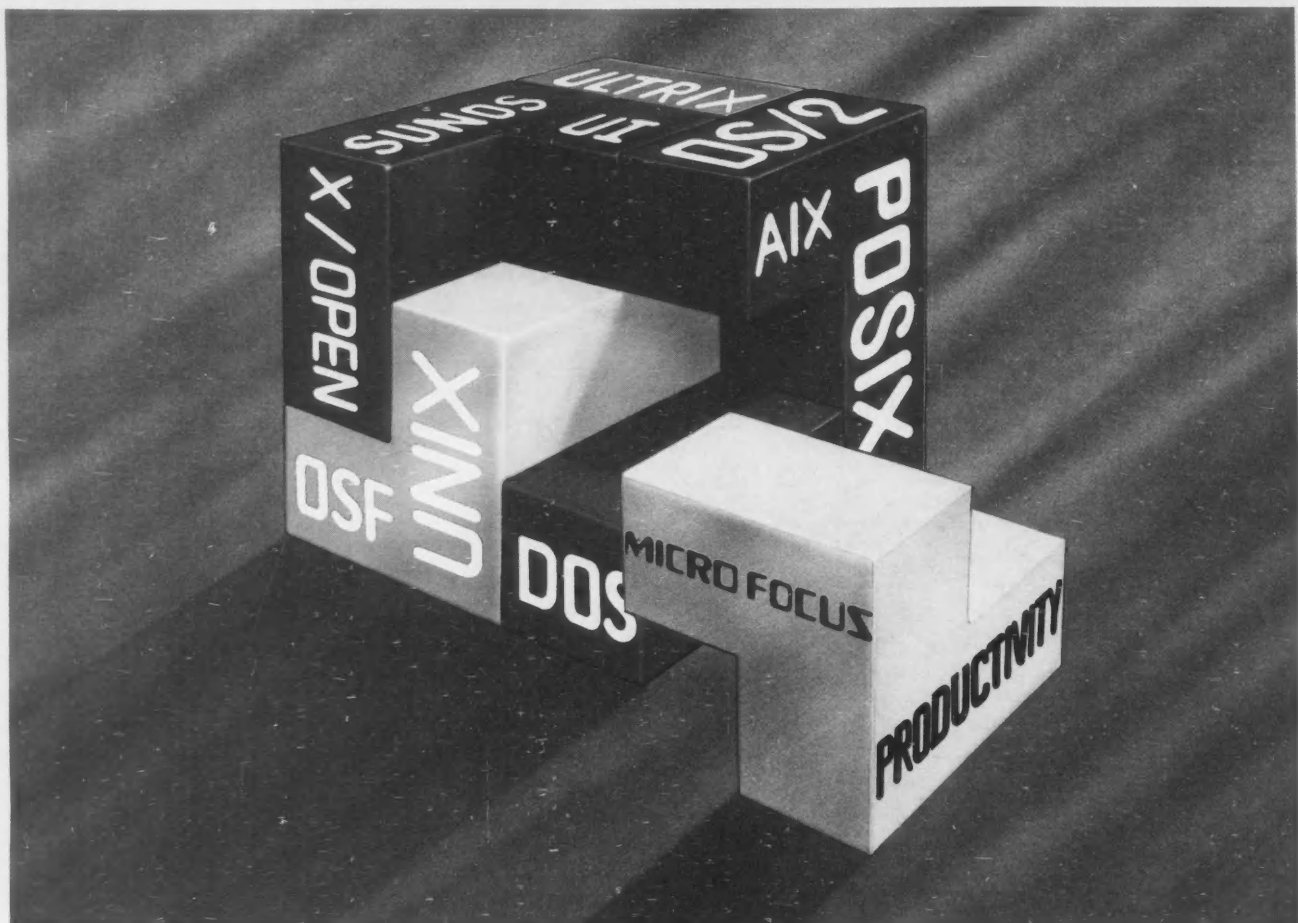
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IN BRIEF

Supermac cuts prices

■ Sunnyvale, Calif.-based **Supermac Technology**, maker of color publishing and desktop video products for Apple Computer, Inc. Macintoshes, has announced price cuts across its range of offerings. The cuts, some as high as 40%, have already gone into effect.

■ **Banctec Services Corp.**, a Dallas-based subsidiary of Banctec, Inc., has announced that it will provide nationwide on-site service for **Dell Computer Corp.** systems. Banctec's experience in the service arena includes being the first Novell, Inc. support organization.

■ Seattle-based **Aldus Corp.** has announced the release of **Aldus Technotes** for Aldus PageMaker Version 4.0 for Windows 3.0. The publication will offer technical information to PageMaker 4.0 users. The 320-page volume is available for a list price of \$39.95 directly from Aldus. Customers subscribing to the Customer First Premier, Premier Online or Corporate Library programs will receive **Technotes** free of charge.

Suit may hurt Microsoft users

Hardball strategy in \$4.4B copyright case could blow up in Apple's face

ANALYSIS

BY JAMES DALY
CW STAFF

Apple Computer, Inc.'s disclosure that it plans to ask for \$4.4 billion in damages in its high-stakes copyright infringement suit against Microsoft Corp. indicates just how miserable Apple plans to make life for Microsoft — and quite possibly, for users of Microsoft products — if it

wins the case.

However, that hardball strategy, which includes asking the courts to order Microsoft to stop the sale of Windows 2.03 and 3.0 and to destroy all copies of the programs, could blow up in Apple's face.

"If Apple really cares anything about the user, they will not try to take Windows off the market," said Robert McPhee, a research engineer at Du Pont Co. in Newark, Del. "If they try

to pull a stunt like that, I would consider getting rid of all my Macs." McPhee estimated that there were up to 500 Macintoshes in his imaging department and several thousand in the Du Pont organization.

Apple sued Microsoft and Hewlett-Packard Co. in March 1988, charging that the overlapping windows and icon manipulation screen features in Windows 2.03 and HP's New Wave, which is based on Windows, violated

Graphics heat up the Windows war

BY CAROL HILDEBRAND
CW STAFF

As presentation graphics move into the Windows war zone, the maturing market is withering the computer industry's start-up spirit and increasing the decibel level of corporate marketing mouths.

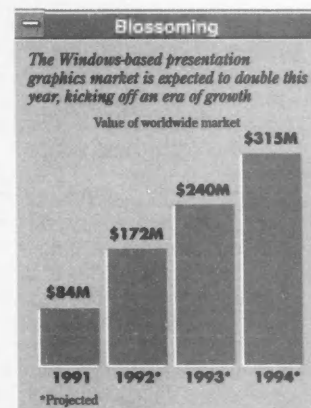
Analysts said current conditions emphasize two or three industry heavyweights using more marketing clout than technical savvy to dominate the market, leaving less room for smaller companies with fewer resources.

"A former market that supported eight or nine packages might shrink to four or five," said Bill Cogshall, president of New Media Research, Inc. in Los Altos, Calif.

Rather than being a driving factor, presentation packages tend to be pulled along as users

switch their more mission-critical applications over to graphical environments, according to Cogshall.

"Graphics packages won't drive the switch-over, but if you moved for other reasons, you'll probably have to switch over," he said.



Source: New Media Research, Inc.

Bundlemania

Thus, bundling strategies abound. Two of the most active companies in this endeavor, according to Cogshall, are Microsoft Corp. and Lotus Development Corp.

Microsoft has been following an aggressive bundling strategy that has users picking up PowerPoint, Microsoft's presentation offering, virtually for free when they purchase the vendor's office bundle. Lotus is also reportedly evaluating a similar

Continued on page 44

Impact

An Apple win in its suit against Microsoft could be felt by more than 6 million Windows users

Worldwide installed base, year-end 1991	
Macintosh	Windows
8,422,900	6,286,900

Source: Computer Intelligence/Infocorp

Apple copyrights.

The suit was also later amended to include the best-selling Windows 3.0. The case could go to trial as early as June or July, said William Neukom, vice president of Microsoft's law and corporate affairs office.

The potential ramifications of the case for vendors and users have made it the most closely watched litigation in the personal computer industry.

"Once again, we're seeing a war between two vendors with the user getting crunched in the middle," said Joel Diamond at the Windows User Group in Media, Pa.

Halt unlikely

Analysts said it is unlikely that Apple will be able to bring a complete halt to Windows sales because it would be too traumatic to the industry. Already, Microsoft has shipped nearly 10 million copies of Windows, and it has become integrated in mission-critical applications at major corporations.

Additionally, some Windows developers have privately said that if Apple were to halt the sale

Continued on page 44

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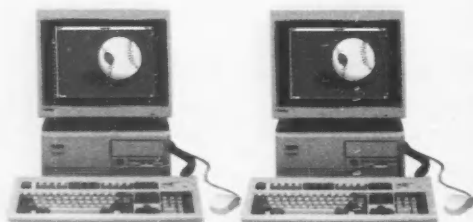
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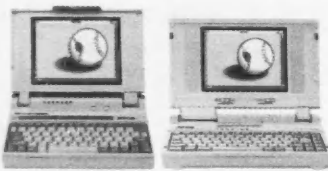
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Ports	Serial, Parallel, External VGA Monitor, Modem	Serial, Parallel, External VGA Monitor, Modem, External FDD, External PS/2	Serial, Enhanced Parallel, External VGA Monitor, Modem, External FDD, External PS/2
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Security	—	Standard	Standard
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Video (GrayScale)	VGA	SVGA	
Ports	Serial, Parallel, Mouse	Serial, Parallel, Mouse	
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Toshiba's T2000SXE: Expensive, but worth it

Technology Analysis — a roundup of expert opinions about new products. Summaries written by freelance writer Emily Leinfuss.

Toshiba America Information Systems, Inc. T2000SXE offers a good mix of features for a slightly higher than average price. It is also heavier than some of the competitors but otherwise has no major flaws, according to reviewers.

Performance: Overall, the Toshiba T2000SXE offers very good performance, according to *PC Computing* magazine.

Ease of use: Even though Toshiba trimmed the size of its keyboard to fit this small machine, it still offers a full 82-key version. The display is small but clear and sharp.

Power supply: Toshiba's use of nickel hydride batteries gives the machine an outstanding battery life. Tests range from three to five hours, and it recharges in one hour.

Design: The Toshiba notebook has a very slim form factor of 1.9 in. One design glitch is that the mousepad port and keypad covers detach and can be lost easily.

Value: Priced at \$4,218, the machine is deemed relatively expensive, although it offers solid features. Reviewers noted Toshiba's support policies, documentation and system design as being outstanding.

Toshiba's T2000SXE

Reviews	Performance	Ease of use	Power supply	Design	Value	Overall
<i>PC World</i> 11/91	NC	Small screen, but sharp	Outstanding	Large, well-designed keyboard	Pricy	Solid choice
<i>PC Computing</i> 11/91	Very good	Soso keyboard	Very good	Very good durability	Expensive	Good features
<i>Computer Buyers' Guide</i> 1/92	Excellent	Excellent screen	Good	High quality	Priced at high end	Top performer; solid company
Users						
Teresa Doyle, Dean Witter Reynolds	■	■	■	■	■	Good product
Alain Poirier, Polygon Records	■	■	■	■	■	Good machine
Analysts						
George Thompson, Datapro Information Services Group	■	■	■	■	■	Leadership product
Andrew Seybold, Dataquest, Inc.	■	■	■	■	■	Not state-of-the-art
Mike Kelly, Techtel Corp.	■	■	■	■	■	Bulletproof
Cheryl Currid, Currid & Co.	■	■	NC	■	■	OK

Key: ■ Very good ■ Good ■ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Brian Fernandez, Catalyst Associates	■	■
Rick Martin, Prudential Securities, Inc.	■	■

Toshiba America Information Systems is based in Irvine, Calif. The company is the laptop manufacturing division of Toshiba.

Toshiba responds

Ron Smith, product marketing manager:

Performance: The T2000SXE's performance equals or exceeds machines of the same class.

Ease of use: There are a few things to do to increase screen brightness. The machine defaults to semibright, but you can set it at bright. It also has an IBM Video Graphics Array change display program that allows users to adjust the gray scaling.

Panasonic CF-370H6: Not all that it could be

Panasonic's CF-370H6

Reviews	Performance	Ease of use	Power supply	Design	Value	Overall
<i>PC World</i> 11/91	Marginal	Nice, wide screen	Short battery life	Good	Reasonable price	Poor support; decent machine
<i>PC Computing</i> 11/91	Good	Small display	Good	Excellent durability	Average	Average
<i>PC Week</i> 6/3/91	Poor	Unusual display	Good subsystem	Construction lacking	High price	Nothing special
<i>PC Sources</i> 8/91	Company performance leader	Excellent keyboard	Quick recharge	NC	NC	Expands line
<i>Computing Canada's</i> 9/2/91	NC	Standard screen	Good	NC	Good features	Not differentiated
Users						
Paul Reagan, Transamerica Natural Gas Corp.	■	■	■	■	■	Usable, state-of-the-art
William Callies, Ph. Orth Co.	■	■	■	■	■	Durable, dependable
Analysts						
Cheryl Currid, Currid & Co.	■	■	■	■	■	OK
Andrew Seybold, Dataquest, Inc.	■	■	■	■	■	Also ran

Key: ■ Very good ■ Good ■ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Brian Fernandez, Catalyst Associates	■	■
Rick Martin, Prudential Securities, Inc.	■	■

Panasonic Communication and Systems is based in Secaucus, N.J. The company is the laptop manufacturing division of Panasonic.

Panasonic responds

John Gowa, computer product manager:

Performance: We feel the product is at a mid-point for performance of 386SX 20-MHz notebooks. The same is true for battery life.

Value: This year, we had a transition in our phone support system in order to better our technical support, and if the reviewer called in the middle of the transition, there may have been some delay.

A solid performer with a 60M-byte hard disk standard, Panasonic Communication and Systems' CF-370H6 is seen as an average value despite these features. Short battery life and disappointing service are the system's drawbacks, reviewers said.

Performance: Evaluations of the Panasonic notebook computer's performance range from marginal to good compared with its competitors.

Ease of use: The machine has a good keyboard and an unusually bold and easy-to-read display font. *PC World* noted that it is easy to work with on an airplane seat-back tray.

Power supply: The Panasonic notebook offers poor to average battery life, ranging from 2¼- to 3½ hours. However, its battery recharge is faster than most.

Design: Panasonic's notebook is intelligently designed, and the machine is lauded for its generous supply of random-access memory (5M bytes) and 60M-byte standard memory. At 6 pounds, 13 ounces, it is fairly heavy. The machine offers excellent durability, according to *PC Computing*.

Value: The somewhat high price of \$3,991 for the notebook is balanced by the machine's large hard drive capacity. *PC World* said the company has terrible technical support and service with no turnaround guarantee.

To Computerworld Readers:

A PUBLIC SERVICE MESSAGE FROM PETER NORTON



There's been plenty of apprehension in the business community lately about the Michelangelo Virus. How many DOS PCs will be hit when it activates is anyone's guess. Personally, I would be disappointed to see even a few people lose their data.

As viruses go, Michelangelo is particularly destructive (there are more than 1,000 other known DOS viruses and strains today). If your computer is infected, every year, on March 6, Michelangelo will reformat your hard disk and then overwrite it to make sure your data can't be recovered.

The Michelangelo Virus is spread by floppy disks, rarely over networks or on-line services. Once your PC is infected, every floppy disk you use will be infected automatically by the virus.

The Michelangelo Virus moves the hard disk partition table even before it activates, so simply deleting the virus makes DOS unable to access your data. It also corrupts the root directories of floppy disks it infects, so you can lose access to your files.

The virus can be eliminated at any time before it activates, but when it *has* activated, the repair cannot restore the contents of your hard disk.

HOW TO CURE IT BEFORE MARCH 6TH

The good news here is that most careful PC users aren't infected. But just to be sure, the Norton AntiVirus Lab has created a special, *free* version of the Norton AntiVirus.™

The Norton AntiVirus has been protecting people against the Michelangelo Virus for 7 months (we found it *before* it spread). This special edition will detect and eliminate only the Michelangelo Virus* from your system, in just a few minutes.

As a company whose customers number in the millions, we feel it's our duty to help keep all computer users safe from threats like this one. That's why Symantec is joining with computer industry and business publications to bring you this special software program. I hope you take advantage of it, and enjoy safe computing for years to come.

Sincerely,

Peter Norton

Peter Norton

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- 2. Use the Symantec BBS.** Just log on and follow the simple on-screen instructions. 2400 baud: (408) 973-9598 • 9600 baud: (408) 973-9834 (Please be patient, we might be overloaded.)
- 3. Call for a floppy.** Dial 1-800-343-4714 ext 707. There is a \$9 shipping and handling charge for the software on disk. You can use your Visa or Mastercard.
- 4. See your local participating computer dealer.** We're shipping diskettes to all of our dealers who request them. They will charge a nominal fee, too.

P.S. If you have DOS 3.3 or above, and don't get protection before March 6, set your PC clock ahead to March 7 on or before March 5. This won't get rid of the virus, but it *may* prevent it from activating and reformatting your hard disk on March 6 of this year, if you haven't eliminated the virus by then.

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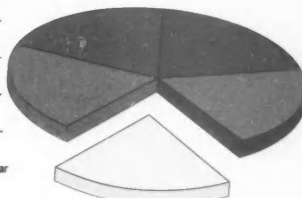
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 - 31. Programming Management, Software Developers
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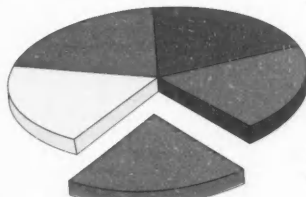
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 - 65. Communications Systems/Public Utilities/Transportation
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 - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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Doing the Texas Three Step

Dell, Tandy and Compuadd are among those computer companies making a name for the Lone Star state in technology

BY MICHAEL FITZGERALD
CW STAFF

Deep in the heart of Texas, the stars are big and bright, the prairie sky is high and wide, and personal computer makers ride tall in the saddle.

Compaq Computer Corp. is the biggest of them, but Dell Computer Corp., Tandy Corp. and Compuadd Corp. provide a solid second tier of companies. Meanwhile, a host of smaller manufacturers, such as rising mail-order star Austin Computers in Austin and Houston-based Texas Microsystems, Inc. are beginning to make their presence known.

Texas, in fact, is nearing the point where as many significant PC players are based in it as in California.

Locals credit IBM's Austin facilities and Texas Instruments, Inc., which has its facilities spread throughout the state, as breeding grounds for new high-end technology firms. The founders of Compaq and Compuadd both worked at TI first (as did new Compaq President Eckhard Pfeiffer), for instance, and the state does not lack engineers, with the presence of Electronic Data Systems Corp. and a large number of universities.

■ Dell Computer Corp., Austin

Dell hit the \$800 million sales mark in 1991, a year of record revenue and profits for it at a time when the industry in general struggled. But analysts said they think Dell will not be immune to continued economic chills in 1992.

"Dell's growth is going to slow



Tandy's Elias wants to start with a clean slate

closer toward that of the overall industry," said Frank Michnoff, program director at Meta Group, Inc. in Westport, Conn.

While Dell will continue to grow faster than the industry average, Michnoff said its days of "stealing massive amounts of market share" are gone, as IBM and Compaq become more ag-

gressive. Dell's founder and chairman, Michael S. Dell, would not be upset if Michnoff was right.

"The base goal is for us to make sure that we're growing faster than the market, which doesn't necessarily mean that you grow at 71%, like we did in



Company founder Dell: Ultimate goal is to be the No. 1 PC maker in the world

the second quarter [of 1991]," said the 26-year-old Dell.

Dell said he thinks his company's focus on a low-cost structure (\$40 million on plant, property and equipment costs, which he compares with \$919 million for Compaq and \$300 million for Sun Microsystems, Inc.), coupled with judicious research and development spending, leaves the company poised to respond to market trends quickly, with minimal investment.

Dell said his ultimate goal is to be the No. 1 PC maker in the world, although he acknowledged that his company most likely will not be there in five years. "But where are you going to get if you shoot for No. 1?" Dell asked. And while some analysts said Dell has failed to establish a strong presence in corporate America, Dell said 50% of his company's sales are to the Fortune 500 and government accounts.

"For too long, a lot of companies in this business wanted to be Compaq Computer Corp., until they realized Compaq Computer Corp. was not the company to be," said Dell, citing Compaq's cost structure, distribution approach and pricing.

■ Tandy Corp., Fort Worth

The Tandy Center in Fort Worth features an indoor ice rink complete with a Zamboni ice-cleaning machine. The Zamboni might come in handy for Howard Elias, vice president of Tandy Computers, as he attempts to wipe out the memory of the last year and create a clean slate.

While Tandy Corp. still sits in the ranks of the top five PC makers, according to International

Data Corp. (IDC), a Framingham, Mass.-based market researcher, Tandy's own 1991 annual report acknowledged a 3.5% drop in its MS-DOS computer sales worldwide to 528,000 units.

"They've got a problem there, and clearly they've recognized that they've got to fight this trend," said Richard Zwetckhenbaum, a senior hardware analyst at IDC.

Zwetckhenbaum cited Tandy's Computer City superstores, which sell IBM, Compaq and Apple Computer, Inc. equipment as well as Tandy's own PCs, and its leadership role in the MPC multimedia consortium as evidence of a changing Tandy.

Elias said Tandy's biggest problem is one of identity. Its split life as retailer, manufacturer and OEM splinters Tandy in the minds of potential customers.

Still, Elias said he is working

WHERE ARE YOU going to get if you shoot for No. 1?"

MICHAEL S. DELL
DELL COMPUTER

from a base that saw Tandy sell \$1.1 billion in computers in 1991, nearly a quarter of that through its Grid Systems Corp. subsidiary. Its European brand, Victor, is seen as holding a stronger corporate presence than Tandy does in the U.S.

Elias cited multimedia as one way for Tandy to build a presence in the corporate market. Michael Grubbs, a Tandy senior director of marketing, said he predicts that by 1995, "all computers will be huge." Tandy recently landed 400 MPCs at American Airlines.

Still, many observers are skeptical.

"They had market leadership, distribution leadership and technology leadership, and every one of those is gone," said John Dunkle, vice president of Workgroup Technologies, Inc., a market researcher in Hampton, N.H. While conceding that Tandy has a solid base, he pointed to uncertainty about its OEM contract with Digital Equipment Corp. and said, "They may be in more trouble than they look, and cer-

tainly [will be] if DEC expands its relationship with Intel or goes to another source."

■ Compuadd Corp., Austin

With all the attention given to Bill Hayden's battered orange Chevette, one would expect to see it showcased in Compuadd's corporate headquarters. But the car, which served as Hayden's first office (he sold add-in disk drives from it, hence the Compuadd name), was unceremoniously traded in years ago for a Mercedes.

Hayden said he got self-conscious about the Mercedes and switched quickly to a Ford Bronco. That action is typical of the self-effacing chief executive officer and his rugged, hard-driving company. Compuadd drew a lot of attention when the Air Force picked it as the supplier for Desktop IV, a \$1.4 billion PC contract. But the contract was challenged by other bidders and is now being rebid. Hayden takes the news in stride.

"Change is a normal way of doing business for us," Hayden said. "In this business, you have to move fast. We're very adaptive to the marketplace, and we don't know where it'll be two years from now."

The company had its plans in place to handle the new account, which would have added \$400 million in sales to its ledger in 1992. However, Hayden had kept his privately held company reined in and would have hired only 100 or so new employees, mostly in manufacturing (the company uses the same plant IBM built its original PC in), to handle Desktop IV. This kind of discipline is nothing new for Compuadd — the story told in its spartan halls relates how the company provided \$31 million in machines to the U.S. forces in Operation Desert Storm less than 3½ weeks after it got the order.

Losing Desktop IV was partially offset by Compuadd's landing its single biggest corporate contract to date, a \$53 million deal with Sears, Roebuck and Co. for new point-of-sale systems.

Hayden has kept Compuadd's retail arm and said he expects the company will open its 200th store this year. Like Tandy's Radio Shack stores, Compuadd stores sell only its own brand of PCs, with a variety of vendors' peripherals on the shelves.

In a way, Compuadd thrives on a military model. Judith Bitterli, its director of corporate sales, hands out Sun Tzu's classic *The Art of War* to new hires. Analysts said Compuadd almost deserves to win armed forces contracts.

"They've got an interesting kind of combat-ready mentality — they're into mobilizing and take a relatively simplistic approach," IDC's Zwetckhenbaum said.

Hayden has split the \$600 million Compuadd into two autonomous companies. Compuadd handles the retailing and corporate



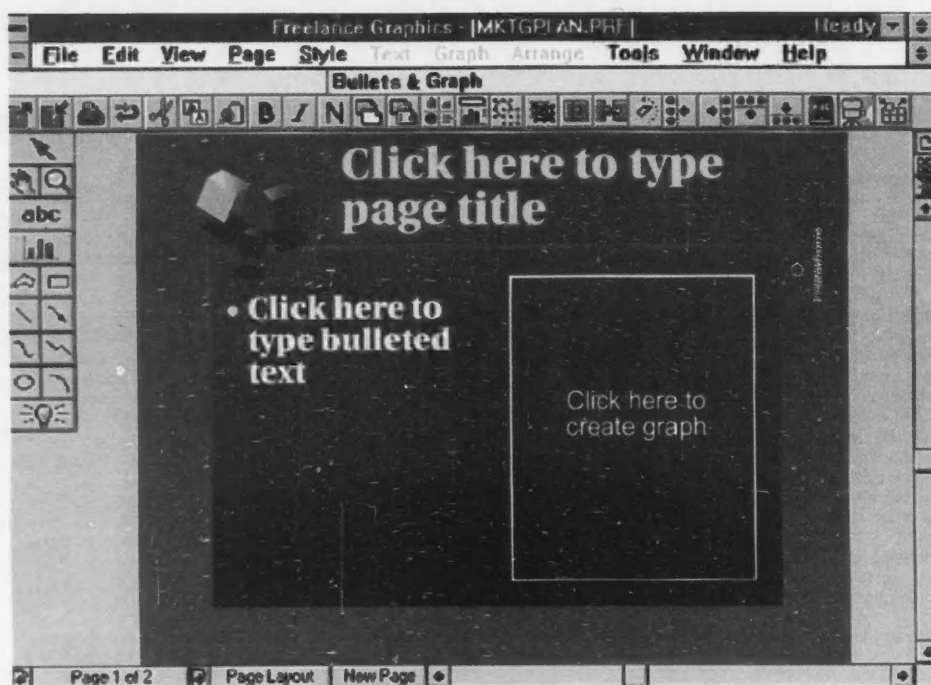
Compuadd CEO Hayden expects his firm will open its 200th store this year

sales, while Compuadd Express continues the company's traditional mail-order sales. Last week, Hayden announced Compuadd will continue this pattern of spinning off autonomous, independent business units, and Edward D. Thomas, its president and chief operating officer, had left the company. Thomas will not be replaced.

Compuadd may gain a place on more corporate buying lists as a result of Desktop IV, even if it does not win the second round of bidding. While Meta Group's Michnoff said he rarely sees Compuadd's name in the corporate user surveys he does today, he thinks the initial press from Desktop IV and the Sears contract will help change this over time.

Hayden said he anticipates a flat year for Compuadd's U.S. sales without Desktop IV, and he is counting on a push into Europe to fuel growth.

He said he is also girding for competition from Compaq and believes Compaq's coming line of low-cost PCs will gain Compuadd "the same success as Apple did" with its hot-selling Macintosh Classic.



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Lawsuit may hurt Microsoft users

CONTINUED FROM PAGE 37

of Windows, even temporarily, they would levy a lawsuit against Apple for monopolistic practices, causing damage to the marketplace.

If Apple prevails, a more likely scenario would be for it to squeeze large royalty

payments out of Microsoft or force Microsoft engineers to rewrite major portions of the interface. Although such a move could buy Apple a six- to 12-month advantage in the marketplace, it would raise concerns among users that older applications may not enjoy 100% compatibility with a rewritten Windows.

Microsoft reportedly already has a battle plan in place if such a development occurs. "Microsoft folks are smart enough to know how to change Windows fairly quickly if they really have to," said Tim Bajarin, executive vice president at Cre-

ative Strategies Research International, Inc. in Santa Clara, Calif.

Some experts said Apple gained confidence and decided to step up the severity of the case last year when U.S. District Judge Vaughn Walker upheld Apple's contention that the visual elements of the Macintosh screen display are original and were not part of the licensing agreement Apple inked with Microsoft in 1985.

Because the original lawsuit included all "derivative works" of Windows 2.03, analysts said they expect Apple to include the upcoming Windows 3.1 into the legal

action soon after its introduction at April's Comdex/Spring '92 in Chicago. "No doubt about it: As soon as [Windows 3.1] comes out, it will be part of this suit," said Robert Kleiber, an analyst at Piper, Jaffray & Hopwood, Inc. in Minneapolis.

The industry is now trying to make graphical user interfaces the standard way that people interact with computers, and Apple knows that whoever owns the legal license to the predominant graphical interface becomes the industry player with the most clout, Bajarin noted.

IBM already has a license to the Macintosh interface for its Unix product and is also expected to use it in OS/2 someday. Together, IBM and Apple could make real waves in the business market, Bajarin added.

Graphics heat up Windows war

CONTINUED FROM PAGE 37

bundling launch, but it needs to get more kinks out of its lead-in product, Lotus 1-2-3 for Windows, before doing so. And while Freehand is garnering respectable sales based on its new upgrade, Powerpoint is in need of a face-lift, analysts said.

For all the companies that would rather have users switch than fight, there is one that is counting on loyalty.

As with the word processing market, the DOS market leader in presentation graphics, Software Publishing Corp. (SPC), was late getting a Windows version of Harvard Graphics to market, leaving the door open for competitors to talk users over to a more punctual product.

No rash decisions

But analysts have noted that SPC seems to have talked most of its major corporate accounts into waiting for shrink-wrapped Harvard for Windows before making any rash decisions.

With the actual shipping products generally well-received, SPC's installed base looks fairly intact, they said.

However, with the worldwide DOS market in presentation graphics expected to slip from an estimated \$325 million today to \$200 million in 1995 — while Windows-based packages should swell to an estimated \$390 million in 1995 — Windows recruitment will be cutthroat.

"I think the market is too crowded," Coggsall said. "The stakes are getting bigger, and the industry is getting more brutal. Companies are not well-advised to jump into this market at this time."

With the three market leaders set at Microsoft, Lotus and SPC — all of whom have large installed bases to exploit — analysts said the second-tier vendors (in terms of market, not product, strength) appear to be Aldus Corp.'s Persuasion; Micrografix, Inc.'s Charisma; and Hollywood, the orphan of the IBM Desktop Software Unit that has found a home at Claris Corp.

Although Aldus had a fourth quarter that was below projections, analysts still project that the company should be bouncing back by late second or early third quarter of 1992.

Coggsall pointed out that Charisma suffers from such deficiencies as a lack of outliner and a rather primitive on-screen slide sorter, but Micrografix is one of the most experienced Windows developers on the scene, and an upgrade is expected within the first half of this year.

Claris has just put out a minor upgrade of Hollywood, but this product's problem is not so much individual features as an overall low profile. "Claris needs to get some marketing going here," Coggsall said.

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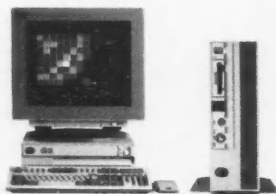
The new RISC System/6000™ POWERstations

and POWERservers 340, 350, 520H and 560 all boast significantly more sizzling performance—from 24

to 65 percent. But for all this increased power, they're priced to give you even more value than

before. We're also introducing the POWERstation 220 — a workstation with a SPECmark™ of 259 compared to the SUN IPCs™ 134—that can give you the power of UNIX® computing for less than \$6,400.

Model	SPECmarks™	Performance Increase
POWERstation 350	71.4	65%
POWERserver 340	56.6	30%
POWERserver 560	89.3	24%



Our open systems open wider.

Of course, even the hottest performance can only take you so far if you can't share it. So we've made networking with the RISC System/6000 family even easier. NetWare® for AIX®/6000 from IBM lets desktop systems like DOS, Windows™ and OS/2®

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NEW PRODUCTS

Systems

Mobius Computer Corp. has announced the Mirage series of Unix workstations bundled with Clarity Software, Inc.'s Rapport office productivity software.

The Mirage workstations are based on Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) and are certified as completely compatible with Sun computers. Mirage systems run on a 25-MHz Sparc chip set.

The Rapport software, normally priced at \$895, includes word processing, spreadsheet, graphics, electronic mail, audio and other modules. It automatically

converts multimedia documents to native file formats for communication with a common personal computer, Apple Computer, Inc. Macintosh and Unix applications.

List pricing for the workstations begins at \$4,990.

**Mobius Computer
Building 410
5635 W. Las Positas
Pleasanton, Calif. 94588
(510) 460-5252**

Software utilities

Desktop Commander, recently announced by Sofdesign International, Inc., allows

users to customize Hewlett-Packard Co.'s New Wave desktop.

Desktop Commander includes color controls, title editing for icons and screens, a system resource monitor, a date/time display and other features.

The product is priced at \$79.95.

**Sofdesign International
Suite 209
1303 Columbia Drive
Richardson, Texas 75081
(214) 644-0098**

Wordstar International, Inc. has produced upgrades of its Correct Grammar product for DOS, Microsoft Corp.'s Windows and the Apple Computer, Inc. Macintosh.

The new version features customizable rules, improved accuracy and network

support. The DOS and Windows versions are \$99; the Windows version costs \$119.

The company has also announced three new writing utilities, Correct Writing, Correct Letters and Correct Quotes, and a Windows version of the American Heritage Dictionary software.

**Wordstar International
201 Alameda Del Prado
Novato, Calif. 94949
(415) 382-8000**

Macintosh products

Userland Software, Inc. has begun shipping its Frontier 1.0 software.

Frontier is a development platform for scripts that automate Apple Computer, Inc. Macintosh functions. Frontier programs allow users to customize and control the Macintosh file system and Macintosh applications. Frontier scripts can be launched from the Finder desktop or from within applications.

The software costs \$179; discounts are offered for five- and 10-unit purchases.

**Userland Software
490 California Ave.
Palo Alto, Calif. 94306
(415) 325-5700**

New storage products for the Apple Computer, Inc. Quadra have been announced by Procom Technology, Inc.

The products include a 3½-in., 1G-byte internal hard drive priced at \$4,349 and Gigatower subsystems for disk-mirroring and networked applications, with pricing starting at \$8,495. The Gigatower products feature 15-msec access times.

**Procom Technology
200 McCormick Ave.
Costa Mesa, Calif. 92626
(714) 549-9449**

Development tools

Protoview Development Corp. has released Protogen 2.1, a visual applications development tool that also generates code.

The new version generates code for Borland International, Inc.'s C++ Object Windows library in addition to ANSI C language code. It also offers an enhanced menu design facility that creates reusable menu templates.

Protogen 2.1 is priced at \$199. An introductory price of \$49.95 is offered until March 31. Upgrades cost \$49.95.

**Protoview Development
353 Georges Road
Dayton, N.J. 08810
(908) 329-8588**

Magic Fields, a software tool for creating validated data-entry screens in Microsoft Corp. Windows applications, has been announced by Blue Sky Software Corp.

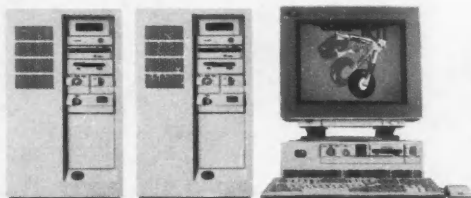
Users develop data-entry screens via mouse, and code is generated automatically. The program performs validation tasks to ensure that data is entered in an appropriate format, with numeric, date, international currency, social security number and other formats supported.

The software costs \$495. An introductory price of \$349 is being offered until approximately the end of April.

**Blue Sky Software
Suite 3
7486 La Jolla Blvd.
La Jolla, Calif. 92037
(619) 459-6365**

you heat?

of the new IBM RISC System/6000 models.



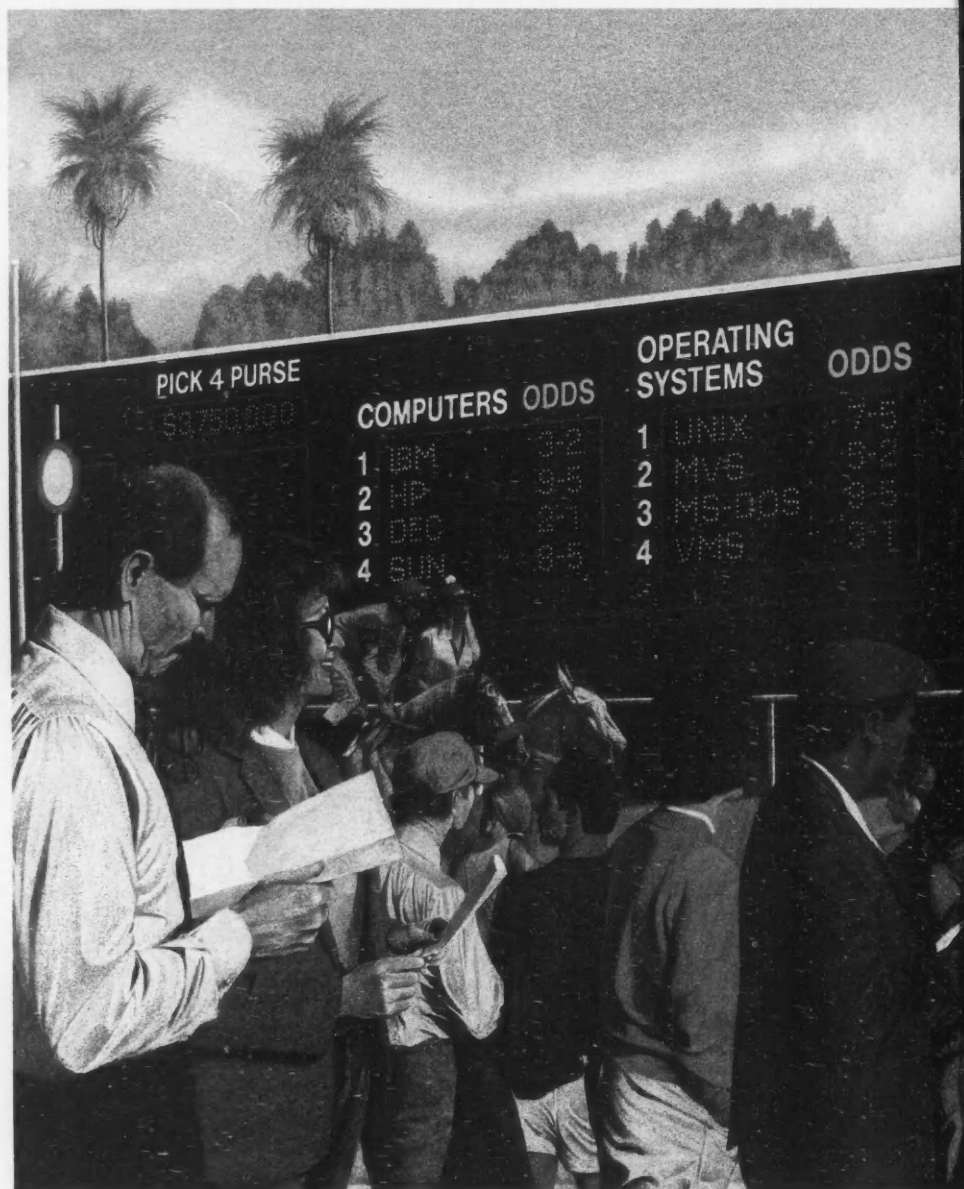
connect on a LAN with RISC System/6000 servers. So whether you have an Ethernet or a Token-Ring LAN, the power of AIX is now available to everybody. And with more than 5,000 applications to choose from, your range of solutions will never burn out.



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For the Power Seeker.**

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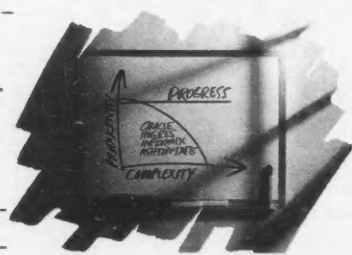
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How? PROGRESS PROVIDES you with the most flexible fourth generation language and relational database system available including ANSI standard SQL. It's specifically designed to do 100% of the job, enabling you to build industrial-strength applications with a single, high-level language. Without resorting to unproductive third-generation languages.

THE SEAMLESS PROGRESS environment gives your application the flexibility to run on almost every major platform. And to connect to most network protocols and other databases. This ensures portability and interoperability in an ever-changing heterogeneous environment.

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PROGRESS applications are fully portable across the broadest spectrum of hardware platforms, operating systems, networking protocols and user interfaces. So many, in fact, that we had to list them here in small type: AIX™, A/UX™, BTOS®, OS/2®, UNIX®, ULTRIX™, VMS™, XENIX®, DECNET™, LAN MANAGER™, NETBIOS™, NOVELL® NETWORKS, TCP/IP, MICROSOFT® WINDOWS™, and the X WINDOW SYSTEM™. Also, PROGRESS lets you process information in other databases, including ORACLE, Rdb and RMS.

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WORKGROUP COMPUTING

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IBM vows to reinvigorate LAN Server

BY JIM NASH
and ELISABETH HORWITT
CW STAFF

BOSTON — In a voice barely above a whisper, IBM announced ongoing preparations this month to reinvigorate its LAN Server network operating system. However, network managers said they want to see hard evidence of commitment from IBM before they will bet on the software's future.

The announcement that IBM

has spent a year assembling a 300-person networking development team in Austin, Texas, was made at Networld '92 in Boston. Few other facts were revealed, however, leaving some managers wondering exactly what IBM was talking about.

Jeff Lawler, a systems programmer at Unum Life Insurance Co. in Portland, Maine, said through the briefing, but he said he was left "trying to pick up on whether this [statement] was about LAN Server 2.0 or some

new product." Lawler is involved in a beta test for Version 2.0.

"Up until now, IBM has [lacked] an expressed vision for LAN Server," said Russ Graft, manager of network services at General Electric Nuclear Energy in San Jose, Calif. "My question is, are they just reacting to worries that LAN Server is dead, or do they really mean it when they say LAN Server will grow?"

In a subsequent interview,

IBM's Art Olbert, Personal Systems director for networking systems, said LAN Server's development team has tripled in the last year in order to "take the place of what Microsoft was doing for IBM." Microsoft Corp. and 3Com Corp. built LAN Manager to leverage the OS/2 operating system in 1987. LAN Server is one of several descendants of LAN Manager. The new product will be "an extension of LAN Server," Olbert said.

IBM plans within "two to

three years" to create its own X.500-compatible directory and naming service, enabling users to access resources across multi-people networks, Olbert said.

Matt Cain, a senior analyst at Meta Group, Inc. in Westport, Conn., said that while IBM is moving in the right direction, it cannot hope to beat out Novell, Inc. in its plans to unleash its own directory service for Netware this year.

LAN Server will incorporate remote procedure calls, based on the Open Software Foundation's Distributed Computing Environment standard. The calls, com-

Continued on page 51

CC:Mail, Notes plan wins early approval

BY ROSEMARY HAMILTON
CW STAFF

Lotus Development Corp.'s plan to integrate its electronic-mail and groupware software prompted an initial thumbs-up from some users and analysts.

The company has a three-phase strategy to bring together its CC:Mail E-mail software, which it picked up from the acquisition of CC:Mail, Inc. last year, and its Notes groupware software, which provides a number of workgroup functions, including messaging.

"I had some concerns that

CC:Mail would get phased out in favor of Notes," said Todd Greeno, manager of internal consulting at Pfizer Pharmaceuticals, a division of Pfizer, Inc., where CC:Mail was installed prior to the Lotus acquisition. "But I agree with the concept that if they can reduce the technology to one [mail] engine, that's all well and good."

David Marshak, a vice president at Patricia Seybold's Office Computing Group, said the company had been "a little vague" in its plans for the two products. But "what they now are saying is that ultimately, these are going

to be the same products, but you can buy them in different packages.

"They are ensuring that users don't have to change what they are used to doing," Marshak said. "They are keeping the interfaces and evolving them so that they will eventually come together."

Additions available

Eventually, Lotus will market a single mail product, and users can elect to add the more advanced features of Notes to their basic messaging system, said Eric Sall, director of product and applications marketing for Notes. Sall said the company had not yet determined how users would pay for the Notes add-on.

"There will be some credit when upgrading," Sall said. "Even today, we try to address this on a customer-by-customer

basis, but [this process] will be formalized."

Lotus will initially provide gateways to link the two products and expects to have a single back-end mail engine in 1993, Sall said. He explained that the changes should be transparent to the end user as Lotus works to have standard user interfaces across all applications.

"This helps because we all want to do the same thing: have a relatively uniform interface across products," said Ronan McGrath, vice president of information systems and accounting at Canadian National Railways in Montreal, where both CC:Mail and Notes are installed.

The first phase will provide an improved gateway, scheduled for delivery in the second quarter of 1992. This initial phase will add directory synchronization features as well as enhanced

import and export facilities.

By year's end, Lotus said it expects to move into the second phase, which will provide tighter integration. For instance, Notes users will have the option of using the Notes mail facility or CC:Mail from within the Notes environment.

In addition, Lotus will be moving to a single back-end environment, although a gateway will still be needed. However, the Notes and CC:Mail systems will at this point share administration tools, Sall said.

The third phase, slated for next year, will provide a "common back end that both can talk to," Sall said. "On a strategic level, their plans make a great deal of sense and could strengthen both products," said Bill Higgs, an analyst at Infocorp, a division of Computer Intelligence.

Motorola cellular group downsizes while growing

BY ELLIS BOOKER
CW STAFF

ARLINGTON HEIGHTS, Ill. — Why is Motorola, Inc.'s cellular subscriber group preparing for its fourth major move in five years? Blame business. Lots of business.

Between sales of cellular phones, transmission gear and switching equipment — manufactured by a sister unit known as the cellular infrastructure group — activity in the group that includes Motorola's cellular business skyrocketed from \$682 million in 1986 to \$2.87 billion in 1991.



Connor: Seeking to reduce IS costs to less than 1% of sales

While that sort of expansion would have put pressure on any information systems group in any industry, the fierce cost-cutting that has characterized the cellular phone market has had an added effect.

"The average selling price of cellular phones is dropping 20% to 25% a year, and that makes for a tremendous pressure to cut costs," said William D. Connor, corporate vice president and director of information technology at General Systems Sector (GSS). GSS is the umbrella group for Motorola's two cellular businesses as well as its computer group.

All three GSS groups have a goal of driving the cost of IS to less than 1% of sales by 1993. "That's about one-half the average cost of computing for a typical manufacturing company," Connor said. Already, the three GSS groups claim average IS expenditures of 1.4% of sales, besting Motorola's overall IS cost of about 2.8% of sales.

Key to achieving these goals is a plan — committed to paper only six months ago — to move applications from proprietary hardware and software to distributed, Unix-based microprocessor platforms. Motorola's own Multipersonal Series 8000 family of reduced instruction set computing (RISC)-based servers became the chosen platform early on because of its quality and because, Connor said, "We have more influence on this vendor than any other."

The RISC systems are proving to be more flexible, faster and less expensive to run than the IBM mainframes that previously handled some customer da-

Opening up

A shift to open systems goes hand in hand with Motorola Cellular's relocation of its Illinois-based operations

Libertyville
Move from
Arlington Heights
starts in
May 1992

Arlington Heights
47 processors
242 X terminals
717 async terminals
73 printers

MOTOROLA INC.

Buffalo Grove
T1 link to
Arlington Heights:
1 MPC200
23 X terminals
93 async terminals
23 printers

Grayslake
T1 link to
Arlington Heights:
6 X terminals
13 async terminals
4 printers

Kennicott
PBX link to
Arlington Heights:
7 async terminals
1 printer

Source: Motorola, Inc.

CW Chart: Michael Siggins

tabases and the IBM 4381s that managed a homegrown manufacturing/distribution application.

But the ultimate benefit is that this platform will allow Motorola to turn to off-the-shelf software applications and development environments and away from custom programming. Currently, GSS has dozens of Unix

applications in production or under evaluation from vendors such as Oracle Corp. and Informix Software, Inc.

Not surprisingly, the cellular subscriber group, the group under the most intense competitive pressures from the outside, is the furthest along in IS downsizing and a move to Unix.

Continued on page 50

Users restless for LAN management

BY ELISABETH HORWITT
C/W STAFF

BOSTON — Novell, Inc.'s recently announced Netware Management System may be the closest thing to a definitive local-area network management platform to come down the pike. However, Novell's product will not ship for some time to come, and there are still plenty of unmet user demands waiting for a third-party solution. At least that is what a slew of small but feisty network management software vendors were claiming at the recent Network '92 show.

Third-party announcements concentrated on the areas that are top user priorities and yet are still largely unaddressed by leading LAN vendors, such as systems management, configuration management, inventory management, network simulation and advisory programs.

To date, most vendors "have concentrated on fault management and not much else," said Bechir Abbassi, a manager at Texaco, Inc.'s information technology department. Crucial missing pieces of current network management products include configuration management, tools to correlate alerts and isolate problems across multivendor networks and tools that automatically respond to common network events and advise users of the likely cause of a problem, he added.

Ambitious efforts

One of the more ambitious third-party efforts to attack this problem came from Dolphin Networks in Norcross, Ga. The

company announced LAN Command Professional, a Netbios version of its artificial intelligence-based Netware management system, LAN Command. The product is said to automatically search out network nodes and display them on a map, monitor the network for errors and alert administrators of potential problems on any device without the need for additional software on network nodes.

The AI-based software is said to learn from experience, generating cause-and-effect rules based on network events. Multiple windows display network events in real time, graphical depictions of traffic trends and net-

work alerts with probable causes.

The Netbios version of the system is slated for shipment in May, priced at \$895 for a 50-node network. The product runs on IBM personal computer XT's and AT's.

By the third quarter, Dolphin intends to enhance its system to collect alerts from Novell's Netware Management System, a spokesman said.

Also announced by Dolphin was LC Benchmark, a performance measurement and simulation package for Novell Netware 286 and 386 networks. The product is said to measure performance of individual stations, two-station dialogs or the entire network. It is said to test CPU, memory, network card, video card and local hard drive performance as well as simulate performance of a planned system on the basis of information gained from tests of similar configurations.

PHH Relocation and Real Estate Management Services, USA is interested in products

such as Dolphin's that promise to "monitor LAN performance, correlate multiple alerts and advise us on what to do," said Charles Venter, director of technology services at the Wilton, Conn.-based firm. As PHH moves more of its applications onto LANs, its information systems department needs a way to aid users who do not know how to diagnose problems on their LANs, Venter said.

Novell's new platform could

provide third-party vendors with a useful de facto standard that, if supported, also provides links to "manager of managers" platforms, said Leo Spiegel, executive vice president at San Diego-based consulting company Lansystems, Inc. This standard eliminates the need to write separate links to IBM's Netview, Hewlett-Packard Co.'s Openview and other key systems — a job that many small software firms cannot afford to undertake,

according to Spiegel.

Third-party support should make Novell's platform more attractive to companies such as United Parcel Service, Inc. (UPS). "There is no silver bullet for network management, no one piece of software, manager of managers or technology" that solves all problems, according to Randy Smith, a UPS telecommunications manager. UPS is taking care to build flexibility into its network management strategy, "so that you don't get locked into the network management 1992 equivalent of [IBM's] SNA," Smith said.



Networld '92: Much to offer

Browsers at the recent Network '92 show in Boston found plenty of LAN management software to peruse. The following is a sample of products introduced at the show:

• **Shany, Inc.** in Culver City, Calif. announced Alertview. Alertview monitors operating systems, network operating systems, applications, network hardware and wiring. It includes a direct link to IBM's Netview. The software is said to identify software that generates an error and the sequence of events leading to the alert. The DOS-based product is priced at \$4,950 for 100 PC workstation licenses, \$2,750 for the manager module.

• **Xtree Co.** in San Luis Obispo, Calif., introduced Xtreenet 2.07 for remote file and disk management on Netware workstations. Users can copy, delete or edit files on remote network stations and map network drives, Xtree said.

Also introduced by Xtree was Virusafe LANs software, which is said to detect, prevent and eliminate viruses on all LANs. The package is also said to learn from previously unknown viruses to modify and enhance its defenses. It is priced at \$595.

• **Ontrack Computer Systems** in Eden Prairie, Minn., released Netutils 3, a data-recovery and protection utility for Netware 3.X file servers. Included are a Netscan component that searches for and repairs file structure errors after a crash; a Netfile component that performs file recovery and maintenance; and Netdisk, a file sector editor. The software supports Novell Netware Loadable Modules and runs on Intel Corp. 80386 and i486 chips running Netware

3.X. It is expected to ship in April for \$395.

• **Frye Computer Systems, Inc.** in Boston released LAN Directory, an automated LAN hardware and software inventory program. The software is said to allow computer managers to track configuration changes on DOS and Apple Computer, Inc. Macintosh PCs, peripherals and software on Netware LANs.

LAN workstations and file servers are automatically audited for hardware and software elements. Stand-alone PCs can be equipped to support automatic inventory. The product supports Netware 3.1 and will support Netware Management System in the future, Frye said. Available now, it is priced at \$495.

• **ADI Systems, Inc.** in San Jose, Calif., announced Lanexec, a Simple Network Management Protocol-based, hardware-independent LAN inventory and monitoring system. The product is said to support coaxial and 10Base-T Ethernet LANs, Novell Netware V 2.X, 3.X, Lite and anything else using IPX. It is also said to provide SNMP management for Netbios-based LANs. New LAN devices entered into a configuration database automatically get entered onto a topographical map. The software can track network performance and diagnose traffic trends. It includes a packet analyzer for SNMP, IPX and Netbios protocols. It is priced at \$199 for a five-user configuration.

• **Intel** in Santa Clara, Calif., introduced Lanprotect, a server-based utility to safeguard Novell 3.1 against viruses. The product is said to isolate more than 850 viruses and to alert network managers. Due in March, it costs \$995.

ELISABETH HORWITT

Motorola cellular group downsizes while growing

CONTINUED FROM PAGE 49

However, according to Greg Goluska, director of Sector MIS, the biggest issues to date have been organizational and cultural, not technical.

"One of the most difficult aspects has been changing the organizational skills to match a distributed computing model," Goluska said.

For example, to match the three- to six-month product life cycles experienced by the subscriber group, Goluska's 120-person worldwide IS group now

has the following unwritten rule: "If we can't do something within four months, we don't do it."

Speed was important in Europe, where Goluska was able to bring up eight new distribution sites, each with a consistent configuration of Unix hardware and software, in just about three months.

"It means we can distribute applications without an MIS person on site, which is a tremendous savings," he said.

Last month, in fact, Goluska

put in the last component of a completely end-to-end, client/server order-entry system. That application, known as Total Cellular Order Processing System, had its start in August 1987 with an order-entry system for toll-free calls that was developed in a matter of weeks: The system was an emergency response to a competitor's advertisement for a \$700 cellular telephone.

A move to distributed, open computing does, in fact, seem to have a great deal to do with urgency and a need to change old habits and old ways of seeing.

"To change to this new kind of computing," Connor advised, "don't fund the [IS] department. Rather, cut their budget so they must have the new platform to work more efficiently."

IN BRIEF

Eagle acquires Etherport

■ **Eagle Technology, Inc.** and **Shiva Corp.** have announced an agreement whereby San Jose, Calif.-based Eagle will be given manufacturing rights to Cambridge, Mass.-based Shiva's Etherport Ethernet cards for Apple Computer, Inc. Macintoshes and Hublet four-port repeaters for 10Base-T networks. Eagle will also distribute, support and repair the products.

■ Computer maker **Alpha Microsystems** in Santa Ana, Calif., last week announced its entry into the networking field when it formed a networking unit. Staffing for the Networking Business Unit initially will include nine Novell, Inc. certified engineers and five engineers undergoing Novell certification. Alpha Microsystems said it has already introduced several networking and communications products during the past six months, including the Series 90 File Server.

Reinvigorating LAN Server

CONTINUED FROM PAGE 49

bined with application programming interfaces common to clients, servers and hosts, will provide a framework for software that can be ported across OS/2, DOS and Microsoft Windows clients. That framework will support all of IBM's Systems Application Architecture platforms, including MVS, VM, OS/2 and OS/400. Olbert said IBM's Officevision is one set of applications that will run on the resulting framework.

Asked why Microsoft's anticipated Windows New Technology would not be supported at the server in future IBM

network products, Olbert said, "Openness only goes so far." He said IBM's OS/2 and AIX would be supported.

Chuck Dietrich, technical analyst at Duquesne Light Co. in Pittsburgh, said that after hearing conflicting predictions for LAN Server from IBM sales representatives, he made a conference call to the firm three weeks ago. He said he is convinced that there is at least a short-term commitment to LAN Server.

Lawler noted that the LAN Server 2.0 beta-test version he now has works only on OS/2 Version 1.3. Until it runs on the

new version of OS/2, it will be hobbled.

During and after his briefing, Olbert repeatedly complimented Netware, which IBM resells and supports, for doing well what it does best — forming workgroup networks. He said LAN Server will be the choice for companies forming companywide networks, delivering client/server host connectivity.

Not a sure thing

That is anything but a sure thing, Graff said. "LAN Server's perception is not one of enterprisewide capabilities. It does not have the industrial strength that Vines has," Graff said, referring to Banyan Systems, Inc.'s network product.

Darrell Miller, executive vice president of Provo, Utah-based Novell, said

IBM's statements will have no effect on current work and agreements between the firms, despite Novell's having spent a great deal of effort in the last year pushing Netware as a companywide network.

IBM plans to link Novell's directory to LAN Server's directory. However, Miller said, network administrators will have to do some work before clients on the two types of servers can share resources.

IBM also intends to integrate LAN Server's directory with that of its Advanced Peer-to-Peer Network (APPN), Olbert said. While LAN Server supports multivendor client/server systems, APPN will target customers that want to share resources across different IBM platforms over a Systems Network Architecture network, he said.

NEW PRODUCTS

Local-area networking hardware

Cayman Systems, Inc. has announced the Gatorstar GX router-repeater.

The product connects a Localtalk network of up to 96 Apple Computer, Inc. Macintoshes to an Ethernet network. The company said the product offers increased control over networked Macintoshes. The Gatorstar GX can locate individual Macintosh nodes on the network and intelligently shut down and reenables malfunctioning ports. It also features the fastest Localtalk I/O available, the company said.

Pricing starts at \$3,595.

Cayman Systems
University Park at MIT
26 Landsdowne St.
Cambridge, Mass. 02139
(617) 494-1999

X Window

Unipress Software, Inc. has announced a suite of four software products that allow Apple Computer, Inc. Macintosh computers to interact with Unix systems.

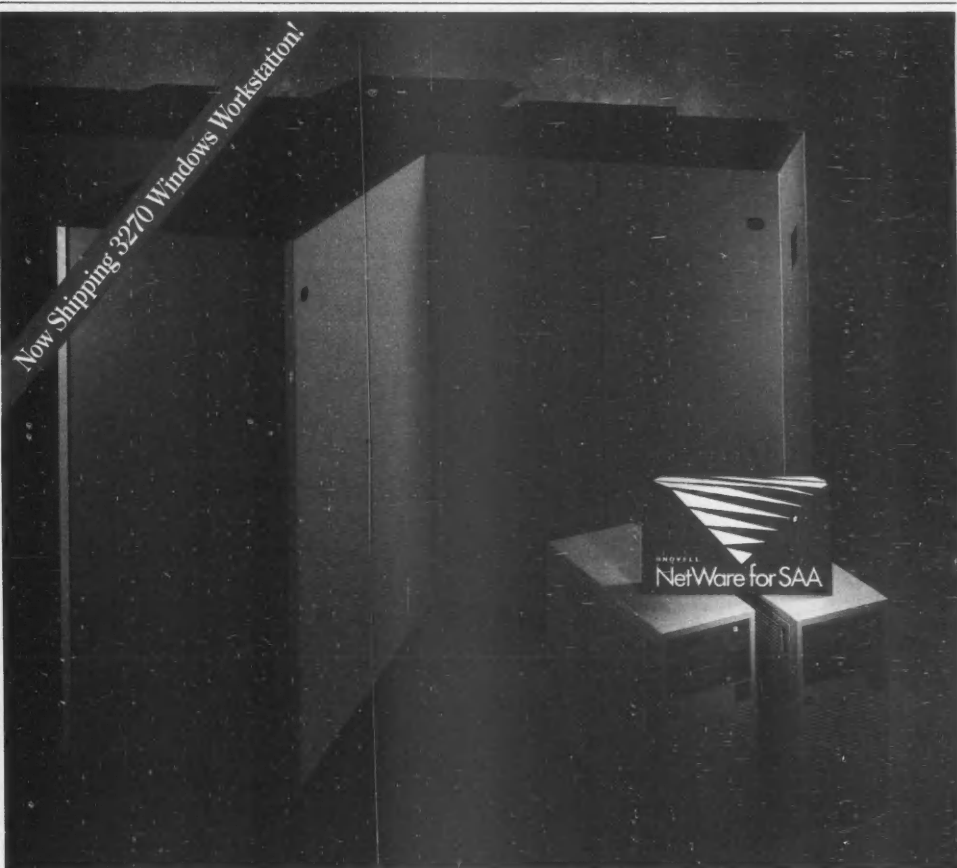
Exodus (\$295) allows Macintosh users to run X Window System applications with cut-and-paste data transfer capabilities between X and Macintosh programs. XGator (\$495) allows X users to display Macintosh applications.

PC-Interface for Macintosh (\$720 for two users) integrates the Macintosh into Unix networks to access Unix programs and share print and other resources.

Machten (\$595) integrates Unix with the Macintosh operating system, providing multitasking. It is bundled with more than 300 Unix programs.

Unipress Software
2025 Lincoln Highway
Edison, N.J. 08817
(908) 287-2100

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Marketplace Pages
on Page 104.



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Computer Corporation

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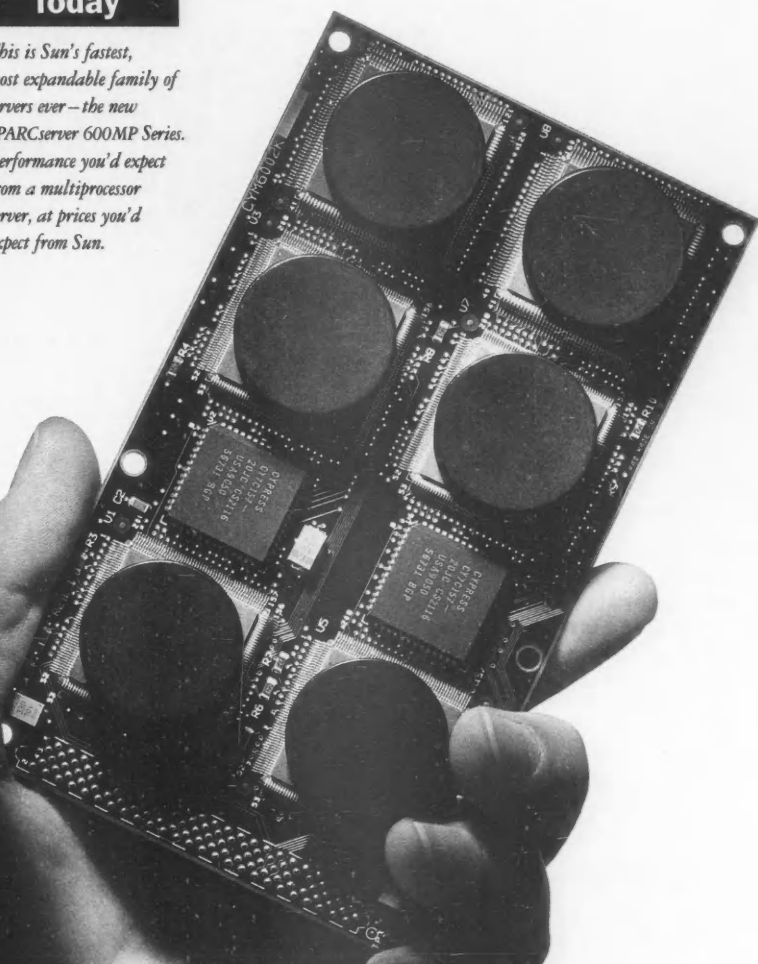


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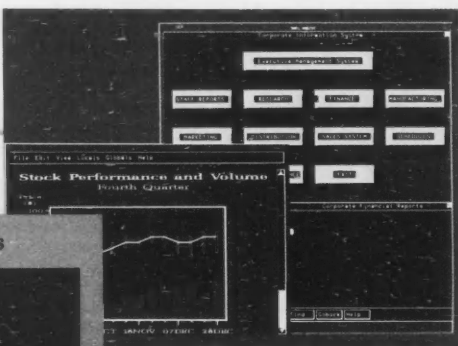


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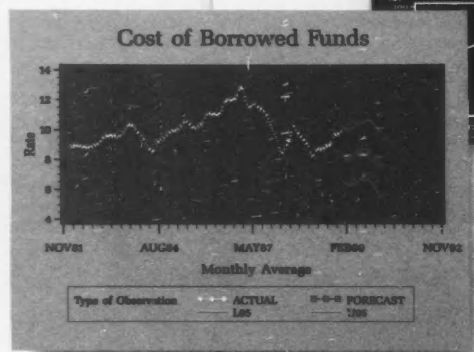
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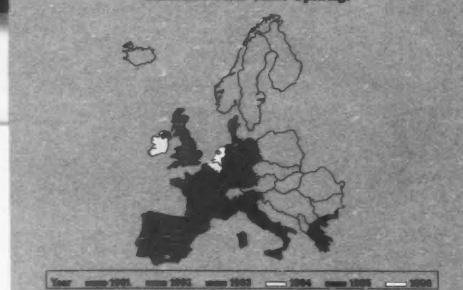
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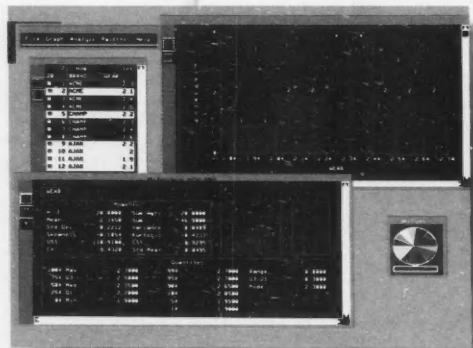
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ENTERPRISE NETWORKING

INTERNETWORKING • SERVICES • NET MANAGEMENT

COMMENTARY

Torrey Byles

Learn from the railroad



The importance of the X.400 protocol and now the X.435 subset protocol for EDI messaging lies in standardizing traffic flow through a collection of heterogeneous, separately owned networks.

Standardization maximizes the usefulness of a given technology base — in this case, electronic networks — whether they are user-maintained LANs or large public networks (such as BT Tymnet or Sprintnet) maintained by a third-party utility.

Maximizing usefulness means maximizing overall network throughput. There are many parallels between today's electronic network standardization efforts and the historic standardization effort of the U.S. railroads in the second half of the 19th century.

Early on, the hundreds of railroad companies that sprang up in the U.S. realized that interconnecting with other railroads and through-traffic business was essential to staying profitable. Consequently, a great standardization effort was undertaken. The least difficult to establish were the physical standards. However, it was not until the mid-1880s, a good 40 years after the railroad construction boom began, that a standard track gauge was adopted.

A standard problem

It was standardizing the operational and accounting procedures that posed the biggest challenges. A single shipment might pass over four or five railroads. It was necessary for all companies to adhere to a uniform method for rating the shipment, sharing the proceeds, managing the handoffs from one company to another and ensuring that the shipment reached the consignee with the appropriate paperwork.

One of the innovations spurred by standardization was the "waybill," or "through bill of lading." This document traveled with the freight, itemizing its contents and destination. All intermediary carriers held

Continued on page 58

Enron gasses up hub plan

Hubs will help gas supplier with bottlenecks, security and bridging

BY JOANIE M. WEXLER
CW STAFF

HOUSTON — For starters, the rat's nest is gone. But the port-by-port switching feature cropping up in smart wiring hubs has also unleashed a wealth of unexpected networking functionality at Enron Gas Services Corp.

The 32-floor Token Ring shop recently replaced about 50 IBM dumb wiring centers supporting 400 local-area network connections with seven Bytex Corp. intelligent switching hubs. The original impetus behind the move was simply to tidy up the wiring closet with more compact equipment, Enron LAN manager Jim Queen said.

However, the firm's subsequent liberation from floor-by-floor cabling constraints is allowing it to electronically "cut and paste" users from one LAN to another. This feature means the firm can alleviate routing bottlenecks, implement security, dump its bridging hardware and perform centralized protocol analysis.

With per-port switching, cabling no longer determines who is connected to what: Once a

node is wired through a hub, it can logically jump from network to network all over the building without physically moving. This capability is currently available on the Bytex hub for Token Rings and on Chipcom Corp. hubs for Ethernets.

A simple point

With a point and a click, network administrators can move users from one network to another on the same or different floors without a trip to the wiring closet. This has eased the headache and expense of moving users at Enron, which said it has moved the work areas of about 90 employees since installing the hubs in mid-December.

The firm plans to move approximately 65 users this week without pulling any wire. Director of Information Services Tom Schoeve estimated that the Bytex switch will allow him to swap two floors' worth of users in about an hour.

Enron has discovered the benefits of electronic cut-and-paste in several scenarios. For example, "We're getting into new applications that we'd like to test," Schoeve said. He ex-

plained that bringing up test applications on a production ring could impact that network's users adversely. With the Bytex hub, the firm can create a separate logical ring for testing.

Queen is implementing a similar configuration with the firm's printers. He explained that with printers strewn about on multiple LANs, each LAN gets cluttered with additional overhead. This is because when a user sends out a print job, it travels across the network to the file server, then back out onto the ring to reach the printer. With the printers on a separate ring, "I still have traffic to the file server but eliminate the network traffic back out to the printer," Queen explained.

Similarly, the firm has been able to reconfigure 4M and 16M bit/sec. Token Rings to take advantage of their optimum speed. A LAN made up of nodes running



Enron Gas Services Corp.
Houston, Texas

• **Challenge:** LAN manager Jim Queen seeks an efficient way to handle the networking aspect of employee relocations and eliminate wiring mess.

• **Technology:** Bytex Series 7700 intelligent-switching hubs.

• **Results:** Managers can switch users to new networks with the click of a mouse rather than having to deal with a wiring closet.

both 4M bit/sec. and 4/16M bit/sec. switchable Token Ring adapter cards requires the entire LAN to default to the 4M bit/sec. speed. Queen has cut and

Continued on page 58

AT&T takes over Ardis management

BY ELLIS BOOKER
CW STAFF

WHITE PLAINS, N.Y. — AT&T network operators have taken over management of the physical portion of Ardis, the wireless data carrier jointly owned by Motorola, Inc. and IBM.

Two weeks ago, Accumaster Management Services, the AT&T unit that provides network outsourcing services, signed a \$70 million, five-year deal to provide Ardis with network management, services and hardware.

Moving Ardis to AT&T facilities will provide customers with improved network redundancy and protection from outages, Ardis executive Rob Euler said.

For Ardis, AT&T will provide a mix of network and network management services from a centralized network management center based here — one of four centers AT&T maintains nationwide for shared-hub customers. A larger number of AT&T-provided network management centers are located on customer premises, AT&T said.

Under its own Accumaster Integrator system, AT&T will manage the physical portion of Ardis. However, Ardis' own network operations center in Lexington, Ky., will continue to control the logical Ardis network —

a packet radio network with some 1,250 radio transmitters with coverage in the top 400 U.S. metropolitan areas — using IBM's Netview management system.

Although AT&T will not pro-

Third-party help

AT&T's network outsourcing unit recently announced it would use a third-party network simulation software package to better manage the T1 networks it provides to its customers.

The Hi-Per-T Service enables AT&T's Accumaster Management Services to better predict the real-time faults and performance of T1 networks and take preventative action, AT&T said.

The core technology for Hi-Per-T comes from the Clearview system developed by Clear Communications in Lincolnshire, Ill.

The optional Hi-Per-T will cost \$100 to \$500 monthly per T1.5 circuit, depending on type, quantity, number of locations and length of contract, AT&T said.

For the fee, AT&T guarantees better than 99.8% disruption-free service per month on AT&T T1.5 circuits (based on a collective performance average on 10 or more circuits). If uptime falls below this threshold, AT&T will waive the monthly management service fee charged to the Accumaster Management Services customer.

ELLIS BOOKER

vide numbers, observers have heard that Accumaster Management Services has signed up about 30 customers.

Still, AT&T is offering outsourcing for a different reason than the classic information systems outsourcing, according to Tom L. Nolle at Voorhees, N.J.-based CIMI Corp. In the IS outsourcing scenario, users want to turn their variable costs (systems maintenance, personnel and hardware) into a long-term fixed cost. But Nolle said he believes AT&T is more interested in "getting relatively unsophisticated users to commit to large-scale, advanced [network] services," and so it bundles in the management of these services.

Euler said the so-called Ardis-net means his company will be able to consolidate 32 of its own radio network controllers into six AT&T-managed sites.

The individual radio transmitters had used dedicated lines to link to the 32 controllers, which in turn had attached to Ardis' three hub sites in Lexington, Ky., Lincolnshire, Ill., and El Segundo, Calif. The 32 controllers will be consolidated into six AT&T facilities, which are collocated with AT&T's digital network facilities.

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just a buzzword?

can work; paying big dividends—in happier users and leaps in performance—often from existing equipment.

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PS/2s connected through Ethernet and Token-Ring to an IBM RISC System/6000™ server. The system meets everyone's needs, from DNA analysts to bookkeepers.

CIGNA's Direct Marketing Division uses PS/2s tied to local OS/2® servers and mainframes. The application runs cooperatively across all platforms, data is stored in LAN and host servers, and PS/2s display GUI screens.

In both cases, users are experiencing new levels of productivity. But the one thing they never see is their systems' complexity.

To learn more, see an IBM marketing rep. Or, to have one call you, call 1 800 IBM-6676, ext. 770.

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BT maneuvers for global market position

ANALYSIS

BY ELISABETH HORWITT
CW STAFF

LONDON — British Telecommunications PLC is marshaling a variety of services in an all-out effort to position itself competitively in the burgeoning global network outsourcing market.

One indication of the carrier's determination to gain acceptance as a global rather than a UK-based carrier is its recent decision to change its name to BT, eliminating the "British" and its local connotation.

However, while BT has gained a number of large corporate contracts in the past few months, the majority of them have gone to its Global Network Services (GNS) — an X.25 value-added networking service based on BT's old subsidiary, BT

Tymnet, Inc. Still in question is how successful the carrier will be with its more ambitious outsourcing arm, Syncordia Corp.

Formed last fall, Syncordia is a soup-to-nuts outsourcing company that specializes in selling high-speed networks to large corporations with \$1 billion or more in revenue. Syncordia offerings include data networking at 2M bit/sec. speeds, voice and video network services and network management via BT's Concert platform. In addition, Syncordia specializes in providing multilingual, 24-hour-a-day user support services for companies with sites across Europe and Asia, company spokesman David Lyons said.

Spokesmen from both GNS

and Syncordia maintained that the two companies do not compete because GNS targets slightly smaller companies with lower speed networking needs than Syncordia's typical customer. GNS' X.25 packet-switched services typically run at speeds of 9.6K bit/sec.



However, GNS seems to be expanding its mandate in a way that threatens to impinge on Syncordia's network offerings and customer bases.

For example, GNS recently introduced a frame-relay service that supports 64K bit/sec. speeds, with the potential of going to 1.5M bit/sec. speeds. And GNS, as a value-added network service, is increasingly providing design, support and implementa-

tion services that overlap Syncordia's.

J. P. Morgan & Co. recently awarded GNS a \$20 million contract under which the BT company will plan, design, operate and support an X.25 packet-switched network for the firm.

In addition, GNS will implement and maintain X.25 switches at the financial firm's overseas sites and work with Postal Telephone and Telegraph authorities to implement local links to the sites, company spokesmen said.

So far, Syncordia has announced one contract, with the European airline reservation system Amadeus. The company has been negotiating with IBM Europe and British Petroleum Co. subsidiary BP Chemicals, among others, but it is not yet ready to announce contracts, a spokesman said. It should be noted, however, that BT created

Syncordia from scratch only a few months ago, while it formed GNS more than a year ago out of established BT Tymnet.

As of last November, GNS had nearly tripled BT Tymnet's old customer base, signing up such customers as United States Surgical Corp., Herbalife International, Inc., Teradata Corp., Warner subsidiary Warner Chapel Music and Shared Medical Systems Corp., a GNS spokesman said. GNS' two recent sign-ons, J. P. Morgan and The Gillette Co., are potential Syncordia customers.

BT's idea is to have its sales force suggest either GNS or Syncordia, depending on the needs of a customer, Lyons said. Indeed, some customers have asked for both services to address the varying needs of different user populations within a company, he added. J. P. Morgan, for example, reportedly looked at Syncordia to handle its higher speed local-area network backbone.

Token Ring products dominate Networkworld show

BY JOANIE M. WEXLER
CW STAFF

Token Ring networking enjoyed a high profile at Networkworld '92 in Boston recently, particularly from the omnipresent smart-hub vendors.

►Chipcom Corp. rolled out three new Token Ring modules for its On-line System Concentrator that allow users to establish up to seven Token Ring networks in one hub.

The firm also announced an agreement with Cambridge, Mass.-based Brixton Systems, Inc., under which users will be able to monitor Chipcom equipment through an IBM Netview console.

►Little-known but up-and-coming \$20 million hubmaker Star-Tek, Inc. in Northboro, Mass., announced a hub line that simultaneously supports any combination of Token Ring, 10Base-T and Fiber Distributed Data Interface local-area networks.

According to Star-Tek, its new Focus series incorporates features on each Token Ring hub module to detect and automatically remove any faulty nodes attached to that module, rather than concentrating that functionality on a single management module.

Each Star-Tek Token Ring hub module also sports a jitter cancellation feature, which corrects low-frequency signal distortion to the high-frequency jitter problems supported by vendors such as IBM and Synoptics Communications, Inc.

Proteon, Inc. announced a

similar concentrator-based jitter-busting technology at Communication Networks Conference and Exposition in Washington, D.C., last month.

Both companies' antijitter technology is said to allow support of up to 260 users on a single 16M bit/sec. ring over unshielded twisted-pair wiring.

Star-Tek is rumored to be planning to submit its antijitter technology jointly with AT&T, Bityx Corp. and Ungermann-Bass, Inc. to the Institute of Electrical and Electronics Engineers, Inc. as a competing standard proposal to the one recently submitted by IBM and Synoptics.

►UB added a remote Token Ring bridge/router co-developed with Advanced Computer Communications to its Access/One high-end hub, and Proteon announced that its personal computer-based SNMP/TR Agent for monitoring Proteon's Series 90 and 70 hubs will support Novell, Inc.'s Hub Management Interface (HMI) specification and Novell's integrated Netware Management System (NMS).

According to Proteon, the company will port the SNMP/TR Agent to a Network server to collect Token Ring management information and feed this information into the NMS through the HMI.

►Cabletron Systems, Inc. said it plans to ship modules for its Multi Media Access Center in 90 days. The modules will allow users to create multiple Ethernet networks in one hub, rather than one extended Ethernet.

Bytes

FROM PAGE 55

copies. Also developed were location accountability offices, which helped track the whereabouts of each car. Both the waybill and car-location accounting were to become EDI message types in the 1970s.

Connecting separate railroads into a "seamless" integrated network increased through traffic and thereby increased business. Standardization was essential for maximizing overall network throughput.

With X.400, the global electronic network (ranging from in-house LANs to commercial networks) will gain increased throughput. With more points accessible on the network and with more types of messages possible to send in a single envelope (fax; E-mail; binary files such as CAD/CAM documents, spreadsheets or video; and EDI documents), the user sitting at a workstation will be given many more opportunities to communicate with other users and appli-

cations. This will motivate greater use of networks.

Just as the railroads devised a uniform method for classifying and rating freight, the X.400 standards teams are classifying message "body types."

This is the first step in devising a uniform fee schedule for network transport. However, the internetwork rate structures are far from stable because interconnection is still young and untried.

Auditing methods and the ability to locate freight cars were also developed by the railroads. Today, one of the key features of X.400 is the ability to trace messages through a series of networks. Each network maintains a log of when the message enters and leaves its domain. The same information is attached to the moving message.

Increasing throughput in the railroad network benefited both vendor and user. Vendors benefited (those who survived the inevitable consolidation) by seeing their revenues rise and costs-per-track-mile decrease. Users benefited from lower

transportation prices and a greater range of service options (more trains running at more times of the day with a wider range of rates).

Having changed the economics of transportation, the railroads also changed the economics of production and distribution. Because railroads allowed for the fast, reliable and frequent movement of goods through the economy, producers and distributors with the wherewithal could market products to mass markets, not just local or regional markets.

With accessibility to mass markets, producers and distributors could greatly expand their operations, and goods were able to reach a much greater number of buyers.

Today, similar transformations in scales of production are taking place as networked businesses and networked markets become the base infrastructure in which commerce is conducted.

Bytes is the EDI program manager at Input, a market research and consulting firm based in Mountain View, Calif.

Enron gasses up hub plan

CONTINUED FROM PAGE 55

past the nodes with 4/16M bit/sec. cards onto the higher speed LANs with no cabling changes.

Enron has also been able to eliminate Internet Protocol (IP) routing through its Novell, Inc. Netware V3.11 servers. The firm has computers on multiple floors running terminal emulation to a Sun Microsystems, Inc. server, requiring the Netware servers to function as IP routers. "With the Bityx switch, we can cut and paste those computers to

the Sun ring and no longer route [IP] through the servers," reducing network bottlenecks, Queen said.

The nonissue of where devices are physically located might play to network security at Enron, Schoeve said. He is considering running his Novell file servers side by side in the secure network control center alongside one of his switching hubs. Previously, the file servers were required to be on various individual rings and were unse-

cured, he said.

The switch could also indirectly ease the onerous task of file server backup. Remote backup through the company's bridges took so long that there were instances where users needed their backed-up data retrieved before the backup was even complete. Now that the file servers can reside locally next to one another, the backup process takes about 35 minutes, and the bridges are no longer necessary, Queen said.

Enron plans to add Ethernets to support a growing number of Sun servers and will seek similar capabilities on those LANs.

NEW PRODUCTS

Network services

Pacific Bell, a Pacific Telesis Group subsidiary, has announced plans for a switched 56K bit/sec. service.

The service will provide a dial-up alternative to dedicated lines or lower speed analog lines, the company said.

Pricing is \$500 for installation and \$45 per month for access. Use charges are made at standard voice rates.

Pacific Bell
140 New Montgomery St.
Route 604
San Francisco, Calif. 94105
(510) 823-3654

Gateways, bridges, routers

Fibronics International, Inc. has designed the FX8210-B multiprotocol bridge/router.

The FX8210-B bridge/router works with heterogeneous Fiber Distributed Data Interface (FDDI)-backbone networks to increase network efficiency and flexibility, the company said. It connects one or two Ethernet networks to an FDDI backbone and allows the network manager to specify data routing and traffic patterns.

A single-network configuration costs \$21,990.

Fibronics International
1 Lowell Research Center
847 Rogers St.
Lowell, Mass. 01852
(508) 937-1600

Newport Systems Solutions, Inc. has announced the PC2LAN/X.25 remote shell.

The software product gives remote personal computer users asynchronous access to local-area networks via an X.25 network. It works with the company's LAN2LAN router, which has been modified to support X.25 access. Up to 64 PCs and LANs can be connected to a single LAN2LAN router.

The PC2LAN/X.25 software costs \$149.

Newport Systems Solutions
Suite 103
4019 Westerly Place
Newport Beach, Calif. 92660
(714) 752-1511

Customer-premises equipment

T3plus Networking, Inc. has unveiled the BMX45N Bandwidth Manager, the first product in its new Unityplus architecture for broadband wide-area networking.

The BMX45N supports complex mesh networking topologies, the company said, allowing users to implement multinode

T3 networks with alternate routing and fault tolerance. Each BMX45N unit switches up to 800M bit/sec. bandwidth and supports up to 12 T3 or four Sonet OC3 links.

Pricing starts at \$42,000 for a non-redundant system and \$65,000 for a redundant system.

T3plus Networking
2840 San Tomas Expwy.
Santa Clara, Calif. 95051
(408) 727-4545

Network management

University of Michigan Software has introduced Netmod Version 1.0, a network

modeling tool. Netmod users can design networks and evaluate the effectiveness of various complex network configurations.

The tool is preconfigured with operating characteristics of a number of network types, including Ethernet and Fiber Distributed Data Interface. The software runs on an Apple Computer, Inc. Macintosh and costs \$500.

University of Michigan Software
Room 2354
475 E. Jefferson St.
Ann Arbor, Mich. 48109
(313) 936-0435

Independence Technologies, Inc. recently announced that its Iview line of software packages can now be purchased as

stand-alone products.

The products include System Manager (\$14,500), which allows users to monitor, control and restart computer hardware, networks, databases and applications; SMNP Agent (\$200), which supports the company's private management information base for monitoring software processes and system performance; Log Manager (\$3,000), which logs error and activity information in multivendor Unix networks; and Event Manager (\$2,500), which lets application processes send and receive events from other processes on the network.

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LARGE SYSTEMS

• SOFTWARE • APPLICATION DEVELOPMENT

IBM users welcome early shipments

Recent low-end ES/9000 announcements take a back seat as users celebrate revised delivery dates

BY JOHANNA AMBROSIO
CW STAFF

Users may not be rushing out to buy IBM's new low-end processors, announced earlier this month, but they said they are impressed that the company is moving up its delivery schedule for some machines introduced last September.

New to the Enterprise System/9000 lineup are the Model 100 — the entry-level processor for the 9121 family — and the Model 200, a rack-mounted machine in the 9121 line that provides a growth path for existing 9221 users.

IBM also said it will ship four ES/9000 models a month earlier than planned, and a fifth will be delivered some four months ahead of schedule. The Models 520, 640, 660, 740 and 860, announced in September, will be delivered this month.

"It's about time they did it," said Paul Maszczak, director of data processing operations at C. R. Bard, Inc. in Murray Hill, N.J. "It's a good sign that they are aware of the competitive field."

On the other hand, he said, the new processors "are not significant for my site. It's a move to fill out the lower end of the ES/9000 product family."

James Gray, vice president of North American information systems at Tupperware, Inc. in Orlando, Fla., agreed. "We just installed a 9121 Model 440, so this doesn't really affect us." He said he sees the early deliveries "as a sign of IBM's getting its act together. They're improving quality and are working very hard to turn the business around."

Other observers said the Model 100 could provide a migration path for 4381 customers. "The Model 100 brings the

entry point down," said Susan Gannon, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "Some customers thought the jump was too large." Although she sees the improved delivery dates sparking customer demand in the first half of the year, the "big question is what is going to happen in the second half" with demand, she added.

Strong demand

Marty Clague, an assistant general manager for IBM's ES line of business, said he anticipates demand will remain strong across the mainframe line during the first half. But he would not speculate about the latter part of the year.

IBM executives also maintained that the early deliveries are a result of a better-than-expected "learning curve" for the ES/9000 models that have al-

ready been delivered. "We executed our plan to deliver the 900 and 820 and installed them just the way we thought. There was no reason to hold back on any of the availability dates," said Andy Hurter, director of data systems at IBM U.S.

Not all low-end mainframe customers will make the leap to the new processors, however. Michael Braun, director of IS at Ministers Life Insurance Co. in Minneapolis, said that even though his shop is a 4381 user, the company may downsize to an Application System/400, "so the announcement doesn't mean very much to me."

Company changes

Other IBM announcements or statements of direction included the following:

- The company is trying to get away from its traditional massive September announcements —

during which the company typically announces 100-plus products — in favor of bringing out new products earlier in the year. "We're trying to announce things early enough for customers to plan," Clague said. "When we announce things in September, customers have already baked the budget."

- IBM is working on massively parallel computers for the commercial market, to be introduced within three years, Hurter said. These MVS-based computers will initially "supplement" traditional mainframes, then probably replace the line by the end of the decade, he said. He added that the computers IBM is working with use more than 100,000 processors.

Also on the drawing board is a "390 microcomputer," Hurter said, but he declined to say when it will be available.

- Hurter said there are no current plans to accelerate the price/performance curve of the mainframe line, which typically comes to about 15% per year. "We will stay the course" for the foreseeable future, he added.

Northern Trust banking on imaging, voice routing for customer service

BY ELLIS BOOKER
CW STAFF

CHICAGO — In pursuit of perfect service for its banking customers, a department of Northern Trust Co. here has deployed a blend of automated voice response, intelligent routing of

bank's private branch exchange (PBX) to the customer database on its mainframe.

This plethora of systems, all in support of customer agents, underscores the fact that quality customer service, like quality cooking, is never the result of a single ingredient. More importantly, this varied menu works, and Juan A. Sistachs, vice president of cash management, has the productivity statistics to prove it.

"Our motto is, we want to take care of the call without transferring it to another agent or losing it," Sistachs said.

Sistachs described his group as a "bank within a bank." Its single line of business is corporate money market accounts.

With just 22 service representatives, the unit handles some 70,000 customer calls a month and manages more than 200,000 accounts. Yet this small group works faster and more efficiently than ever before.

For instance, the average time it takes service representatives to handle a call has dropped from four minutes in 1989 to 2.4

minutes today. Also the "drop-off rate" — the percentage of callers who abandon their calls — has plummeted from 2.9% in 1989 to 1% today. As a final measure, while the unit's business volume has grown by 32%, additional staffers have not been needed.

The automated voice response systems, deployed in January 1989, came first. Designed to let customers with Touch-Tone phones accomplish a variety of mundane banking chores, such as checking a balance or transferring funds between accounts, the voice response system now handles about 60% of all incoming calls.

However, the voice response system was not linked to the service agents, so customers requiring more personalized attention were forced to repeat their account numbers and security codes to the live operators after having just tapped these numbers into their phones. Worse, if

one agent had to transfer a call to another, the customer had to provide his account number a third time.

To address this issue, Sistachs purchased an integrated PBX-to-host computer system from Aristacom. The Aristacom system is linked on one end to the bank's AT&T System/75 PBX switch; on the other end, it is linked to an IBM mainframe. A gateway processor in the form of

an AT&T 3B2 sits in between.

Aristacom's software, called SCIL*Link, takes the customer's account code input from the telephone and cross-references this with a "caller" cross-reference database. The telephone call is then delivered back through the switch to the proper agent; simultaneously, one year's worth of the customer's data, pulled from the mainframe-based IMS database, is delivered to the agent. The Aristacom system was turned on last April.

A year before that, Northern Trust had installed an IBM Image-plus system, becoming one of the first beta-test sites for IBM's mainframe-based imaging product.

From their oversized, 3270-type terminals, agents can display a mainframe screen next to images of pertinent documentation.

All the image scanning is done right in the cash management department. Sistachs acknowledged that this goes against the grain of traditional banking practice, which calls for segmenting of tasks. However, he said, "We've asked to be a showplace, and we want everything to work. So we want control of all the pieces."

ON SITE

Northern Trust Co. Chicago

- **Challenge:** Handling customer service calls more efficiently.
- **Technology:** A combination of voice-response systems, intelligent routing of calls and a document imaging system.
- **Results:** Service representatives handle calls in 2.4 minutes, rather than the previous 4 minutes.

voice and data and document imaging systems.

The technology mix, installed over the past four years, includes an automated voice response system from Syntellect, a mainframe-based document imaging system from IBM and, most recently, a sophisticated call routing system from Aristacom International that connects the

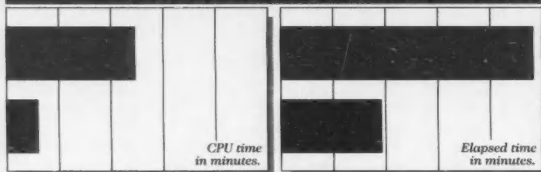


Sistachs says combining voice and image technology means more efficient customer service

Speed Reading For DBAs.

PLATINUM Rapid Reorg[™] vs. DB2 V2.3 REORG Utility

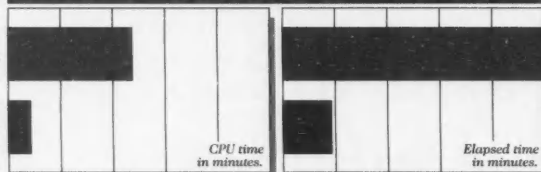
On a 67,700 page tablespace, PLATINUM Rapid Reorg used 3.34 minutes of CPU time compared to 12.68 minutes for the IBM REORG utility. That's a 73% CPU time savings with PLATINUM.



PLATINUM Rapid Reorg's run of 9.57 minutes was 158% faster than IBM's 24.72 minute result. Running PLATINUM also improved EXCP performance. Our run used 35,282 while IBM consumed 54,000.

PLATINUM Fast Load[™] vs. DB2 V2.3 LOAD Utility

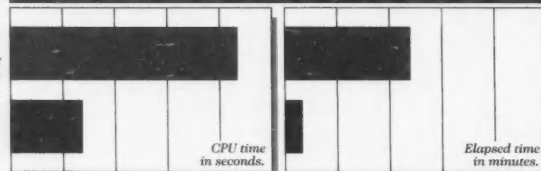
On the same 67,700 page tablespace, PLATINUM Fast Load used 2.82 minutes of CPU time compared to 12.58 minutes for the IBM LOAD utility. That's a 78% CPU time savings with PLATINUM.



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PLATINUM Quick Copy[™] vs. DB2 V2.3 COPY Utility

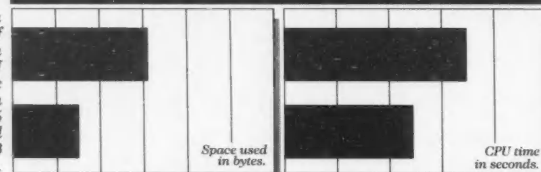
For an image copy of a 67,700 page tablespace, PLATINUM Quick Copy used 12.62 seconds of CPU time compared to 42.49 seconds for IBM. That's a 70% CPU time savings.



PLATINUM Quick Copy's performance of 2.87 minutes was more than eight times faster than the 23.38 minutes it took IBM to copy a 67,700 page tablespace. Our 88% time savings were topped by an EXCP reduction of 90%.

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APPLICATION DEVELOPMENT

User role gains CIO backing

BY GARY H. ANTHERS
CW STAFF

Chief information officers have shifted their views of advanced application development techniques over the past two years and are now putting relatively less emphasis on computer-aided software engineering (CASE) tools while stressing the importance of user involvement.

CIOs also said they believe development tools are meeting their demands for increased quality but are falling short of expectations in their ability to speed software development.

In a recent survey of 430 CIOs, Deloitte & Touche's Information Technology Consulting Group found that the importance CIOs attach to CASE has fallen sharply over the past two years. When a similar survey was conducted in 1989, CIOs using CASE ranked it the No. 1 advanced application development technique. In the latest survey, users put CASE in fifth place, topped by systems development methodologies, prototyping, fourth-generation languages and joint user/developer design sessions (see chart).

"At the front end, there was a lot more promise than reality," said H. Thaine Lyman, Midwest director of information technology consulting at Deloitte &

Touche. "It takes time for an organization to learn to use" CASE tools.

"There was a lot of hype. People said CASE was the solution to all their problems," agreed Steve Hendrick, an analyst at International Data Corp. "But CASE technology is complicated stuff. Firms found out that there was no free lunch and that to really get a CASE program going takes a lot of effort."

Surefire success

"User involvement is a sure recipe for success," Hendrick said. Joint application development (JAD) "sessions and prototyping are just another way to get people to do things in an intelligent fashion. I don't think there's any real magic there."

Nevertheless, CASE use is growing rapidly. One-half of the CIOs said they are using CASE, while just a third were using it two years ago. Seventy percent said they expect to be using the technique by 1993. In those organizations using CASE tools, 29% of the development staff use them, and that use is expected to double in two years.

Use of CASE tools is more prevalent early in development projects than for later activities such as code generation, testing and maintenance. However, CIOs said they expect usage pat-

terns to even out over the next two years.

CIOs cited the growing importance of involving users early in projects, with prototyping rising from fifth to second place on the effectiveness scale. JAD sessions, in which developers and end users work on designs together, also ranked high.

According to Lyman, development staffs are increasingly pulling users into the design process. "Users are so much more literate in the use of technology than they were 10 years ago. Their expectations are higher, and they're not afraid of it," he said.

CIOs ranked cost as the key barrier to the implementation of application development techniques. The techniques' incompatibility with existing applications and a lack of documented benefits make cost justification difficult, they said.

The survey also turned up considerable concern about training time and costs. Lyman suggested that the significant time required to become proficient in the use of application development tools may explain why CIOs said they were disappointed in productivity gains from the tools. Experience gained in initial efforts can be leveraged for better performance on subsequent projects, he said.

Methodical

Systems development methodologies have climbed to the top in effectiveness ratings of advanced application development techniques

Rankings		1991	1989
CASE USERS			
■ Systems development methodology		1	3
● Prototyping		2*	5
● 4GLs		2*	2
■ Joint application development sessions		4	..
■ CASE		5	1
■ PC-based development		6	..
● Application generators		7	6
■ Accelerated development cycle/ Rapid applications development		8	..
■ Object-oriented techniques		9	..
● Other		10	8
NO CASE			
● 4GLs		1*	1
■ Systems development methodology		1*	3
■ Joint application development sessions		3	..
● Prototyping		4	2
■ PC-based development		5	..
■ Accelerated development cycle/ Rapid applications development		6	..
● Application generators		7	5
● Object-oriented techniques		8	..
● CASE		9	8
● Other		10	6

*Tie **No data available

Source: Deloitte & Touche

CW Chart: Tom Monahan

Newcomers to field launch products at CASE World

BY KIM S. NASH
CW STAFF

SANTA CLARA, Calif. — The CASE World show held here last week was a hotbed of new product launches from small application development vendors and companies relatively new to the field, while the major computer-aided software engineering (CASE) makers spent the three days sitting back and explaining their overall product direction.

Hewlett-Packard Co. touted tools for building graphical user interfaces (GUI). HP Interviews Plus is a C++ library targeted at developers using object-oriented programming to make Motif GUIs.

The \$4,950 product, which will run on HP Apollo Division 9000 Series 700 machines and Sparcstations from Sun Microsystems, Inc., is scheduled to ship this summer.

HP Interface Architect 2.0 is an upgraded version of its existing Motif GUI builder. New features on the \$5,000 product include integration with Softbench, HP's software development environment. The package will be available next week, according to HP.

Learmonth & Burchett Man-

agement Systems, Inc. (LBMS) rolled out a new version of Systems Engineer, a personal computer-based CASE module for performing application planning and design. The upgrade includes new data modeling and application prototyping features and is available immediately.

LBMS also outlined partnership strategies with NCR Corp. and Digital Equipment Corp., among others, that include plans to port CASE tools to those platforms.

For Windows tools

Popkin Software and Systems, Inc. unveiled a screen painter for System Architect, a Microsoft Corp. Windows-based front-end tool for planning, analysis and design. The \$195 screen painter, which is scheduled to be available in April, was designed to let developers create GUIs under Windows and IBM OS/2 Presentation Manager without writing code.

The new product is part of Popkin's plan to expand beyond front-end CASE to application prototyping and code generation later this year.

Softlab, Inc. and CGI Systems, Inc. both announced new maintenance products.

CA unveils next step in CASE strategy

Consensus bridges Telon with tools from Bachman, Knowledgeware

BY JOHANNA AMBROSIO
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc. has taken the next step in its strategy to crack the software development market with a product to link its Telon code generator with computer-aided software engineering (CASE) wares from other vendors.

First out the door in the new CA Consensus family is a bridge between Telon and software development tools from Bachman Information Systems, Inc. and between Telon and Knowledgeware, Inc.'s product family.

Separately, CA announced a worldwide, nonexclusive marketing and sales relationship with Bachman; both firms will sell and support the new product. "Computer Associates is acknowledging that it makes the most sense to work with others," said Ed Acly, an analyst at International Data Corp. in Fra-

mingham, Mass. "They are recognizing market conditions."

Acly said the alliance is also significant for Bachman, which "has really been riding IBM's coattails. This will tie them into Telon, which has a pretty decent client base, and will give them more opportunities."

No redundancy

Consensus automates the process of getting specifications from personal computer-based CASE tools into Telon, which runs on IBM mainframes, CA said. That way, developers only have to enter the specifications once in their PC tools.


Consensus runs under IBM's OS/2 Extended Edition, requires Telon on the mainframe and works with Bachman's Analyst 3.1 and DBA 3.1, as well as with Knowledgeware's Information Engineering Workbench and Application Development Workbench Analysis and Design workstations. Consensus should

be generally available within six months; it is priced at \$1,000.

"We want to give users a choice so they can select CA's own upper-CASE tools or something else," said Russell Artzt, CA's executive vice president of research and development. He said the Consensus project was started at Pansophic Systems, Inc.

Future releases of Consensus, Artzt said, will sport an IBM Presentation Manager interface (so users can select specific information to import to Telon), a rules-based system and a bidirectional workstation repository to allow the PC and mainframe tools to reconcile differences.

Furthermore, he added, as Telon becomes available on other platforms, those users will be able to connect to the third-party CASE world. Other Consensus releases will also bring databases, including IBM's DB2 and CA's CA-Datamarc and CA-IDMS, into the scheme.



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IN BRIEF

IBM presents RISC-based S/88 model

■ IBM recently announced its second reduced instruction set computing (RISC)-based fault-tolerant processor. The System/88 4576 Model R28 was designed for on-line, mission-critical applications, such as automated teller machines or emergency 911 systems. According to the vendor, the R28 runs on either the System/88 operating system or the FTX 2.0 operating system. The system is based on an Intel Corp. 32-MHz 1860 microprocessor and is capable of supporting between 32M and 256M bytes of memory. The Model R28 is priced at \$218,000.

■ More than 1,000 independent software vendors have signed up with Unix International's (UI) migration program, which supports migration of applications from personal computers, proprietary and other Unix environment to System V Release 4. UI officials said last week that the program, launched 18 months ago, has added another 2,500 software products to the 18,000 applications already written for System V Release 4.

■ Under a recent deal, Booz Allen & Hamilton, Inc. in Bethesda, Md., will offer training and consulting services for users of Servio Logic Corp.'s object-oriented database management system. Education classes will be tailored for specific customers, the company said.

■ Wordperfect Corp. is offering a trade-in deal for users of Microsoft Corp.'s Word running under The Santa Cruz Operation's Unix and Xenix operating systems. Swap your Word for a Unix or Xenix copy of Wordperfect and get a 10-user copy of Wordperfect 5.0 for half the usual fee of \$1,495. The offer is good through March 31.

■ Unisys Corp.'s 1100/2200 customers will soon have access to client/server products that run under Sybase, Inc.'s relational DBMS. A partnership of Sybase in Emeryville, Calif., and Applied Information Sciences, Inc. in Landover, Md., has developed the product line, which is currently in beta testing.

■ Convex Computer Corp. said it sold more C3800 and C3400 supercomputers than anticipated in the fourth quarter of 1991. The Richardson, Texas-based company shipped five C3800s and 23 C3400s during the last three months of 1991, according to company officials. Since unveiling the two lines in May, Convex has sold seven C3800s and 33 C3400s.

DEC ACMS draws in desktop users

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — Hoping to position itself as a provider of open systems technology for transaction-processing customers, Digital Equipment Corp. recently announced DECtp Desktop for ACMS Version 1.1.

The latest release was designed to boost multivendor client/server support for Unix, Ultrix and VMS workstations with transaction-processing applications on desktop systems.

The "desktop server" portion of the

software resides on a DEC VAX system.

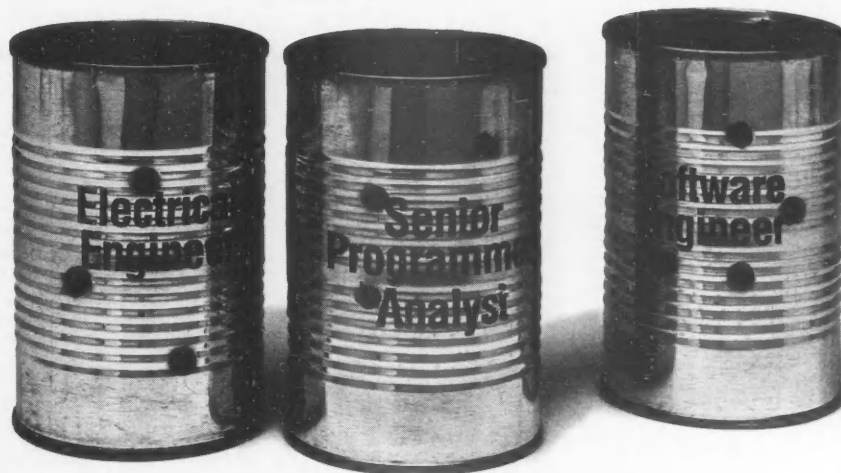
ACMS is DEC's Application Control and Management System, a software product layered on VAX/VMS that defines, runs and controls on-line applications.

Full participants

The latest release of Desktop ACMS will enable customer-written programs on Ultrix, The Santa Cruz Operation's (SCO) Unix and VMS workstations to act as full participating clients in ACMS transaction-processing applications. Additional features include the following:

- Transports for Novell, Inc. Netware local-area networks and Transmission Control Protocol/Internet Protocol networks.
- Visual Basic tools to help users develop Microsoft Corp. Windows-based applications.
- Motif forms for developing Ultrix, SCO Unix and VMS applications.

Desktop for ACMS Version 1.1 is scheduled for availability in fourth-quarter 1992. U.S. list pricing for the software is \$245, according to DEC. Self-paced training, software and documentation are priced at \$495.



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Conference Highlights The full schedule of seminars and workshops will include: Professional Skill Building, Managing the Recruiting Process, New Implications Created by the ADA, College Relations in Technical Recruiting, Technical Recruiting with Co-op Networks, International Technical Recruitment and Immigration, Roundtables and Receptions.

Location The Conference will be held at the INFOMART, near downtown Dallas. Aim for April 5-8 and attend the Corporate Technical Recruiters Conference. **For reservations and registration information and hotel and transportation discounts, call the toll-free Conference Hotline today, 1-800-488-9204.**



Ross advances client/server, non-DEC platform strategies

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Ross Systems, Inc., a \$61 million provider of financial and manufacturing applications for the Digital Equipment Corp. market, is moving ahead with its "client/server" strategy. It is re-engineering its entire product line to support desktop graphical user interface standards and Unix operating systems and to allow users to split their applications work load between DEC or Unix "servers" and a variety of "client" desktop workstations.

At its recent user conference here, Ross showed off its first desktop client/server financial application for the Apple Computer, Inc. Macintosh and said a second one was due by June. Ross also announced its intention to port most of its products, over several years, to Macintoshes, IBM-compatible personal computers running Microsoft Corp.'s Windows 3.0 and Unix workstations running the Open Software Foundation's (OSF) Motif.

Ross Chief Executive Officer Dennis Vohs told approximately 500 users that Ross software would continue to support DEC's VMS and Ultrix operating systems. But there will also be support for the OSF-1 Unix standard from the OSF and The Santa Cruz Operation's SCO Unix for Intel Corp. i486-based machines, Vohs said. As promised at last year's Rossworld, the firm is continuing to port its systems to Unix, with a new Unix general ledger program scheduled to be available in June.

Much of the re-engineering is being done with Gembase, a fourth-generation language Ross gained during its 1991 acquisition of Pioneer Computer Group Ltd., a Northampton, UK, manufacturing software house. "Over the next three years, our entire line will be architected under Gembase," Vohs said. "That will give us more flexibility to support [more] databases and platforms."

Relational databases are high on the priority list at Ross, which is based in Redwood City, Calif. "We absolutely believe that the

majority of our products will be sold over some kind of relational database engine over the next two years," said J. Pat Tinley, executive vice president. "Because we are moving into an open systems arena, we have to look into supporting other relational databases."

Possible RDBMS support

Ross products currently work with DEC's RDB and with the Ultrix/SQL and Ingres 6.0 relational databases from The Ask Cos.' Ingres Products Division. Vohs told users the firm was also considering adding support for RDBMSs from Oracle Corp. in Redwood City, Calif., and Sybase, Inc. in Emeryville, Calif.

Users seemed pleased with Ross' expansion into open systems and client/server applications. "We want to move to a more heterogeneous computing environment," said John Nibbe, a senior systems analyst at W. R. Grace & Co., which has several Decsystem 20s at its Boca Raton, Fla., data center. "We're evaluating a lot of different strategies in office automation."

Database tool may up user maximum tenfold

BY CHRISTOPHER LINDQUIST
CW STAFF

SAN MATEO, Calif. — Trifox, Inc. has unveiled Vortex, which it claims can improve database access performance by as much as 10 times by mapping frequently used data paths.

Wayne Browning, executive vice president of the PRC Public Management Division of PRC Management Services in San Francisco, uses Vortex for public safety systems, including those used by police and fire departments.

He claimed Vortex was cheaper than the previous file management system and afforded significant improvement in response times. "It's like night and day," he said.

The Vortex system consists of the Vortex Accelerator, the Vortex Interface and Vortex Compilers, according to Trifox. The Vortex Accelerator can increase the number of concurrent users on a system through the use of a cursor management system.

Cursors consist of the parsing, object identification, autho-

rization, access path planning, optimization and variable data binding created by an SQL query.

Under normal conditions, these cursors are created every time the query is made, which can monopolize large chunks of memory. The Accelerator catches cursors, allows them to remain open and removes the need for the first five steps to occur every time the query is made, thus saving memory and processing time.

Before Vortex, Browning said, the only option would have been "larger CPUs and more memory."

Vortex supports a wide variety of relational databases, including Oracle, Ingres, Sybase, Informix, Allbase, Ultrix/SQL and RDB. Supported operating systems include VMS, HP/UX, Sun/Unix, SCO Unix and Ultrix.

Pricing is dependent on the number of users, the server being used and the components purchased, ranging from \$5,000 to \$100,000.

Software for a Digital Equipment Corp. VAX 9000 costs approximately \$50,000.

COMMENTARY

Martin Healey

The Unix of the future

The basic reason for the commercial success of Unix-like operating systems such as SunOS, HP/UX, AIX and Ultrix and the problems with so many of the implementations of AT&T Unix V.3 lies in the inferiority of the kernel of the operating system itself. Only with the constraints of a standard 386/486 PC platform is basic Unix System V Release 3 — for example, Interactive 386/IX and SCO Unix — a satisfactory product.

Some Unix vendors, particularly NCR and ICL, have put enough effort into software development to be able to ship an acceptable product with reasonable commercial success, but there are many others who bet on Unix as a savior and are now in trouble. To be fair, it wasn't Unix that caused the problems that Unisys, Bull and others now face, but it did not save them either.

Unix V.3 is the last in the line of the original Bell Labs operating systems. Contrary to the hype, it is a trivial system with simple time-shared sched-

uling, a primitive file system and basic character I/O. Its obvious roles are for university research and small business systems (hence its success on PC hardware). In the minicomputer world of VMS and OS/400, it requires a lot of dressing up to be competitive.

The commercial success of Sun probably confused the situation, but it must be realized that SunOS is actually based on the Berkeley derivative, not Unix, and Sun has significantly enhanced it for the engineering workstation market. Similarly, HP "enhanced" the Unix kernel with HP/UX, and DEC progressively exploited its Berkeley-based Ultrix product.

NCR and ICL probably realized that the success of these enhanced products among engineers was no recipe for success in a data processing and office automation market and tailored their systems accordingly. Note also the failure of Unix to make any penetration with PCs on the desktop, as distinct from multiuser business systems.

With every Unix vendor forced to invest resources into reworking the basic AT&T Unix V.3 software, it is small wonder that so little progress was made during the 1980s. But now, in the '90s, things look better. With new practical marketing organizations, Unix International and OSF, and far better basic versions of the

operating systems — Unix V.4 and OSF/1 — system vendors can concentrate their resources on genuine enhancements — such as system management tools and databases — and not on bug-fixing AT&T "spaghetti" source code.

Thus, at least five years later, significant progress can be made by starting from a firm basis. New versions of Ultrix, HP/UX and AIX will be based on OSF/1 technology and the rest on Unix V.4. Unix V.4 is already there for the PCs, but I wonder if anyone will ever ship an off-the-shelf PC version of OSF/1. OSF/1 looks more like a fountain of technology for its members than an operating system.

The major progress these systems offer today is simply a dramatic improvement in quality. The basic kernels of the OS have been brought up to modern standards with preemptive scheduling and robust file systems. Of course, the commercial systems, such as SunOS, also had such enhancements, but they were tailored by the supplier. Now they can be standard in all versions. Further, the quality of the source code shipped to systems vendors is now far better, and much less time is wasted on debugging.

While special Unix-like systems are available for multiprocessor machines, there is a need for a standard base product

on which to develop new releases. Unix International has now shipped an initial release of a multiprocessor System V.4 kernel, which should appear in manufacturer releases this year, but this was the key advantage of OSF/1. OSF/1 is based on the Carnegie Mellon University Mach Kernel, which was designed for multiprocessor machines from the outset.

We must suppose that as IBM develops a multiprocessor version of the RS/6000, it will develop a new release of AIX based on OSF/1 (and hence Mach). But since OSF/1-based products have taken so long to mature, the potential multiprocessor advantage over V.4 has been lost.

Which microkernel will form the basis of the next generation of Unix-like operating systems? The strongest candidate is probably the French Chorus system, but will both the Unix International and OSF camps adopt the same system, or will they try to develop their own? When a microkernel architecture of Unix with multiprocessor support is available, then it will at last have come of age. The problem is that it will probably take too long, and we will be looking at object-oriented systems by then.

Healey is principal of Technology Concepts Ltd., a consultancy in Cwmbran, Wales.

NEW DEALS

DEC wins \$8.5M pact

■ Lockheed Aeronautical Systems Co. signed an \$8.5 million deal with Digital Equipment Corp. for hardware, software and services to be used in the development of systems software for the U.S. Air Force's F-22 Advanced Tactical Fighter project.

■ GTE Vantage Solutions, a division of GTE Vantage, Inc., recently inked a contract with Barnett Banks, Inc. for imaging and multimedia technology. Barnett said it plans to install the new systems in its own branches, then market them to other financial institutions.

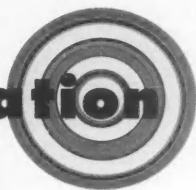
■ Unisys Corp. has identified a beta-test site for its high-end Unisys 2200/900 mainframe, Union Bank of Switzerland. The system is scheduled for volume shipments during the second quarter.

digital

DIGITAL UPDATE

THE OPEN ADVANTAGE FEBRUARY 1992

AT LAST, A Defragmentation Product from Digital



DEC File Optimizer (DFO) for VMS

Consider Safe File Placement a Free DFO Option

If you're a system manager, you no doubt know about the advantages of consolidating file extents through defragmentation. Our DFO product has all the options you expect for file defragmentation. But it doesn't stop at simple defragmentation — it allows for safe "placement" of files for performance optimization.

File placement for performance minimizes seek time — the most time-consuming component of an I/O operation. Studies show that in a typical VMS environment, 50 percent of the I/O requests go to one percent of the file storage, and 80 percent of the I/O requests go to 20 percent of the file storage. By moving unused files out of the way and placing the "hot" files close together, seek time can be reduced to a fraction of the disk space.

Although file placement is intuitively advantageous, the hard part of file placement is deciding which files to move. DFO takes the guesswork out of the process with its interface to two Digital performance monitors, DECperformance Solution and VAX Performance Advisor (VPA). DFO automatically picks up the hot file information provided by these performance tools, adds them to the files you tell it are important, and places those files close together in the center of the disk. If you don't use a performance analysis tool, you can tell DFO which files are to be placed for frequent access and which are dormant.

The question is will file placement work for you? Here's a straightforward solution: Buy DFO for defragmentation; the file placement option is built in, free of charge.

Volume Defragmentation Brings Increased Benefits

A volume is defragmented when the free space is consolidated into a minimum number of extents. Free-space consolidation can make a significant difference in your system's I/O performance. Files typically receive heavy use immediately after creation, so you naturally want those files created close together to minimize head movement. While placing files during the defragmentation process, DFO attempts to create the largest possible free area and consolidate the used areas of the disk. New files have a far greater probability of being created contiguously.

With file defragmentation, file placement, and volume defragmentation through free-space consolidation, your disks can be ready for the next day's round of users.

Safety First

Any product that can affect the integrity of your company's data is an integral part of your business. That's why Digital wouldn't offer defragmentation until it was safe and tested on thousands of disks. You used to back up your disks and then perform the defragmentation process because you weren't quite sure... You won't need to do that with Digital's DFO; there have been no instances of data corruption with our product. Now you won't have to sacrifice the backup performance benefits you might have realized if you had believed in your product's safety.

And Service Too

DFO is the only defragmentation product supported by Digital Services. That means you can count on our worldwide service force to give you the help you need — anytime, anywhere.

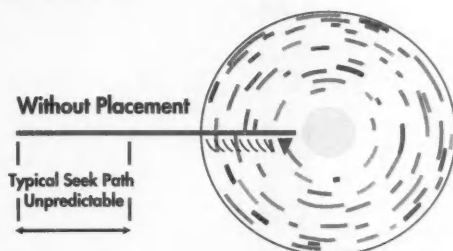
The DEC File Optimizer (DFO)
for VMS is

**Digital designed and
Digital produced.**

This is the product
you've asked for,
but we wouldn't deliver
until it was **safe.**

Now it's
ready to run.

Safe, and then some.

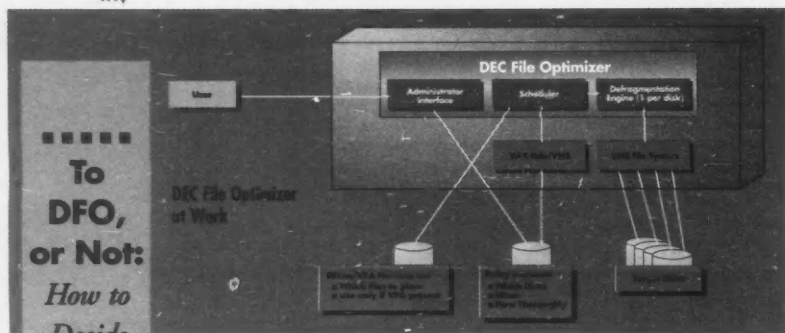


DFO file placement for performance minimizes seek time — the most time-consuming component of an I/O operation. In a typical VMS environment, 50 percent of the I/O requests go to one percent of the file storage, and 80 percent of the I/O requests go to 20 percent of the file storage. DFO moves unused files out of the way to get "hot" files close together, so that seek time is reduced to a fraction of the disk space.

To DFO, or Not?
Read on for the answer.



more on DFO



.....
To
DFO,
or Not:
How to
Decide
.....

Try the volume analysis command for FREE. You don't need a license to analyze your disks. If you have Consolidated Distribution Media, install DFG010. Answer NO to the question about the authorization key, YES to the SETFILENOMOVE question, and DEFRAG to the next question. Then, use the DCL command "\$ DEFRAG SHOW/ VOLUME <disk name>" to receive a defragmentation index and a free-space and file fragmentation summary for that disk.

Working on a 1-to-100 scale, the index provides a quick indication of your disk's fragmentation state. If the index number is above 50, the disk could benefit from defragmentation.

For more information, call 800-344-4825, ext. 315, and receive a FREE DFO poster and calendar, while quantities last.

is Your Information



If you can't answer with an emphatic "YES," it's time to put Digital's Security Management to work for you. Our tools and services can help you protect all your information assets — by maximizing the built-in security features of your VMS systems. We'll help you through all the important steps in securing your entire networked computing environment, from assessing your security needs to ensuring standards compliance.

Where to Begin

If you don't have a security standard at present, the Baseline Security Standard Service can get you started. This service includes analysis of your current VMS system security settings, and documentation of a local baseline security standard.

Digital will help you translate this standard into the appropriate VMS system settings and install the security compliance management tools, DECinspect and DECsrif, on a pilot system.

If you need to develop and deploy a baseline security standard throughout your organization's network, you can take advantage of the Baseline Security Management Service.

As part of this complete service, you receive:

- Help in analyzing the risks to your networked systems on an enterprise-wide level
- Help in addressing the issues of implementing a network-wide baseline security standard
- A plan for rolling out your security system strategy
- Staff training
- A pilot program setup for the DECinspect and DECsrif security compliance management tools.

DECinspect Ensures Compliance

DECinspect is a comprehensive security compliance management tool. Based on a schedule you define, it periodically evaluates compliance of the operating system's configuration with your predefined security standard.

And what's more, you can customize this system through a menu interface that's just as easy to learn as it is to use. This flexibility allows you to set up and manage security for any and all unique or special requirements.

In addition, DECinspect can provide detailed end-system and cluster-wide evaluation reports to the local system manager and transmit reports to a VAXmail distribution list which you establish.

DECsrif Supports Large Networks

DECsrif complements DECinspect by providing consolidated collection, analysis, and reporting of security-compliance data from a network of systems running DECinspect.

Adding to its benefits, DECsrif can automatically schedule security-evaluation tasks such as:

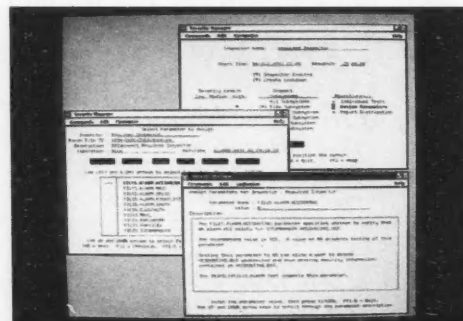
- Collecting security data from DECinspect installations
- Storing the results in the DECsrif database

- Displaying and printing compliance information
- Sending noncompliance memos that report the tests which failed on each system.

Digital's Blanket of Security

With Digital's Security Management tools and services in place to answer your information safety needs, you'll be free to concentrate on the business at hand.

For more information on Digital's complete line of Security Management tools and services, call 800-332-4636, ext. SECURE. And be sure to ask for a FREE copy of the *Security for VMS Systems* handbook.



DECinspect evaluates compliance of your operating system's configuration with your security standard. Windowing helps make it easy to learn, easy to use. DECsrif provides security compliance data in the same user-friendly format.

DFO Ordering Information

Here's a sampling of the Digital systems on which DFO runs. Order today to take advantage of special introductory pricing!

Digital System	DFO Order Number	Price
VAXstation	QL-GJ8A9-JB	\$ 365
MicroVAX 3100	QL-GJ8A9-JC	\$ 720
MicroVAX II	QL-GJ8A9-JD	\$ 1,075
MicroVAX 3400	QL-GJ8A9-JE	\$ 1,596
VAX 4000 Model 200	QL-GJ8A9-JF	\$ 2,188
VAX 4000 Model 300	QL-GJ8A9-JG	\$ 3,484
VAX 6000 Model 410	QL-GJ8A9-JJ	\$ 5,466
VAX 6000 Model 510	QL-GJ8A9-JK	\$ 6,488
VAX 6000 Model 610	QL-GJ8A9-JL	\$ 7,542
VAX 6000 Model 620	QL-GJ8A9-JM	\$ 9,340
VAX 6000 Model 660	QL-GJ8A9-JN	\$ 10,410
VAX 9000 Model 440	QL-GJ8A9-JS	\$ 14,832

Note: Introductory prices are good through July 1, 1992. No minimum purchase requirements. Standard price includes one-year warranty. The Digital cluster-wide license policy applies.

SHORT-TERM LEASING It Could Be Your Best Buy

In keeping up with the fast-paced changes, updates, and new concepts in computer technology, it makes sense to choose an acquisition option that will minimize costs and maximize benefits. And there's no better option than a two- or three-year lease from Digital.

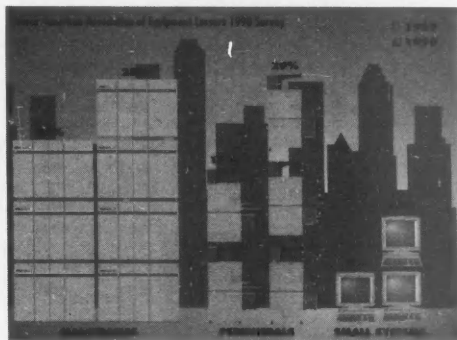
Digital's short-term operating lease plans can reduce your financial risk, while putting the most advanced computer offerings to work for you without delay.

Avoid Risk, Save Money

One of the best reasons to lease instead of own is made clear when you're talking risk factors.

The inherent risk in owning high-tech equipment is the real possibility that this same equipment will become "economically obsolete" much earlier than expected and long before your financial obligations for that equipment have been met.

For example, a computer estimated to be worth 20 percent of its original value at the end of five years could easily fall far short of that amount in three years.



With Digital's short-term operating lease plans, we've taken the worry connected with the devaluation of obsolete equipment off your shoulders. Here's how:

When writing a lease, Digital assumes risk to the extent that it has built an assumed residual value into the lease pricing. You benefit by making smaller lease payments over the life of the lease.

Flexible Options During the Lease

Not only does short-term leasing give you a risk-free way to acquire and maintain state-of-the-art technology, but Digital supplies valuable options, too.

Two common lease options — upgrades and add-ons — give you flexibility during the lease term should you need to expand before the lease term is completed. CPU upgrades within the lease are very common, as is the addition of peripherals to leased systems.

More and more businesses are choosing short-term computer leasing as a way to keep pace with changing technology. Note the rapid percentage growth of short-term operating leases between 1989 and 1990. And the trend is expected to continue.

More Flexibility at Lease's End

Digital's short-term operating lease plans include three end-of-lease options. You can choose to:

- Negotiate a lease renewal
- Negotiate the sale of the system
- Return the system and acquire a new, more up-to-date model.

Say, for example, you need more time to evaluate a new system, so you opt to renew your old lease for another six months. When and if you give this new system the thumbs up, you return the old system, and we write a new lease on the new equipment you have selected. Simply stated, leasing options allow you to call the shots on your terms and in your timeframe.

For additional information on Digital Leasing, call 800-343-3451 (800-322-3239 inside Massachusetts).

Get the Picture? Now Make It Better

There's no better time to upgrade your workstation display with a VR297 16-inch Trinitron Color Monitor. Why? Because it's priced right at \$1,200, and is compatible with any DECstation 2100, DECstation 3100, DECstation 5000, or VAXstation 3100 Color System (except for PX/PNG/PNG-Turbo-based DECstation 5000 systems).

What's more, the Trinitron monitor is plug compatible with and can replace any VR290, VR299, or VR160 Digital Color Monitors. But hurry, this deal is good only while supplies last.

VR297 16-inch Trinitron Color Monitor
Order # VR297-DA/AGC
\$1,200

For more information, call 800-344-4825, ext. 291.

Catch World Tour '92

(Quick, Before It Leaves the Country)

Digital's World Tour '92 will complete its U.S. dates in March. This is your last chance to explore Digital's Open Advantage in action. So if you need help with the planning, design, implementation, or management of complicated computing environments, don't miss this opportunity.

For more information, call Sue Skonetski at 603-884-3022.

World Tour '92 Final U.S. Stops

3/3 St. Louis MO
3/5 Kansas City MO
3/10 Chicago IL

LOOK WHAT'S IN STORAGE FOR YOU

RZ57 SCSI Disks: The Savings Drive Is On

If you're a MicroVAX 3100 or workstation user looking for a great deal on a disk drive, look no further. Prices for the RZ57 1.0 GB 5.25-inch SCSI disk drive have been slashed by as much as 25 percent. And these prices, starting as low as \$5,200, apply to all RZ57 base options including the SZ12, SZ16, and PS1XR expansion boxes, plus Digital's removable RZ57-based disk drive, and all single-unit RZ57 add-on drives.

New RZ58 SCSI Disk: Rates High on Performance

Digital's new RZ58 disk drive is designed to meet the most demanding workstation and server applications. Its 5400 RPM

speed and variable frequency recording capability make the RZ58 the top performer of Digital's RZ disk drive family.

Key features include a 1.38 GB formatted capacity, average seek time of 12.5 ms, average access time of 18.1 ms, and on-track transfer rates of 3.75 to 5.0 megabytes per second.

In terms of hardware compatibility, the high-performance RZ58 is supported on the DECsystem 5900, Personal DECstation 5000, DECstation 5000 Model 100 and 200 Series, MicroVAX 3100 Models 30/40/80, and VAXstation 4000 Model 60 systems. Software-wise, the RZ58 is supported by VMS Version 5.5 and ULTRIX Version 4.2.

The Value of Backup

You're searching for a device that can give you high-volume unattended backup, the best data integrity, and high-reliability media and drive technology.

With Digital's TF85 cartridge tape drive or the TF857 magazine tape subsystem, you can back up as much as 2.6 GB of data in an hour, or as much as 18.2 GB in an eight-hour shift, depending on your host system.

Add FREE installation if you purchase the TF857 or TF85 by June 30, 1992. And if you choose to install either device yourself, get ready to receive a credit of up to \$1,200. Cut your costs even more by trading in your existing TK50 or TK70 tape devices.

Storage Ordering Information

TF85 2.6 GBF Tabletop Cartridge Tape Drive
Order # TF85-TA/AKU
\$11,000

TF857 18.2 GBF Pedestal Magazine Tape Subsystem
Order # SF100-PA/AKU
\$31,000

TF857 18.2 GBF Cabinet Magazine Tape Subsystem
Order # SF200-TE/AKU
\$34,000

Q-bus to DSSI adapter for BA4XX, BA2XX, or H9644 enclosures
Order # QFQSA-SG/AKU
\$3,570

For information on SCSI disks or storage backup products, call 800-344-4825, ext. 26.

IN A PAPERWORK WORLD, DIGITAL IS FIT TO PRINT

Color It Great with Colormate

In a business world overloaded with paper — reports, charts, documents, presentations, and more — there's one way to make your printed material stand out from the crowd. Color it with Digital's Colormate PS thermal wax color printer and produce near-photographic-quality output. And add Digital's DECpresent presentation software for even brighter results.

The Colormate printer's standard features include:

- Resident Adobe PostScript that includes 35 fonts
- 8 MB RAM for down-line font loading and for complex images
- Letter or legal paper sizes
- Serial, parallel, and LocalTalk/AppleTalk standard interfaces.

Plus, the Colormate PS can be connected to a number of operating environments, including IBM PCs and PC-compatibles, as



Digital's Colormate PS thermal wax color printer offers you sharp, vibrant images plus open compatibility with a number of operating environments.

well as UNIX, SCO UNIX, and, of course, VMS platforms. In an Apple environment, the Colormate can be connected directly to a Macintosh via the built-in LocalTalk/AppleTalk port, or it can operate in an Apple network through PATHWORKS for Macintosh, Digital's PC networking software.

When used with DECprint Printing Services V4.1, the Colormate provides a multi-protocol solution, supporting DDIF, TEKTRONIX 4010/4014, HP-PCL, ReGIS, and ANSI.

So if you're looking to make a great impression with your printed material, choose Digital's flexible and versatile Colormate PS printer. Its sharp color and multivendor flexibility will meet your demands for quality departmental printing.

Out with the Old, In with the New LA75 Plus Printer

The new LA75 Plus Companion Printer offers more features for less money, bringing fast, reliable printing capabilities to your busy office environment.

The LA75 Plus is flexible enough to connect to any PC, terminal, or workstation, and provides print support for applications running under VAX VMS, SCO UNIX, UNIX, ULTRIX, and MS-DOS platforms, in color or monochrome.

You want more features? The 24-wire LA75 Plus has them. It offers:

- Both the Digital ANSI-compliant Printing Protocol Level 2 (DEC PPL2) and IBM ProPrinter emulation resident, with built-in serial and parallel interfaces
- Automatic selection of the appropriate interface for given data; no need to switch printing ports manually
- A variety of formats, including fanfold, cutsheet, labels, envelopes, and multipart forms
- Savings on paper costs with "zero tear," auto-park, and last-line viewing features
- 51 dBA quiet mode printing and versatile print modes up to 250 cps.

Whatever your project, be it a professional report or quick draft printout, the LA75 Plus is the best solution for your office document printing needs.

PrintServer Software Lets SUN In

Once again, Digital has demonstrated its commitment to Open Systems by offering PrintServer Software for SUN SPARCstations, Version 4.0. This easily installed software kit has not only simplified multivendor computing, but for the first time it brings to non-Digital computing environments the features and benefits that have always been available to VMS and ULTRIX users.

Good News for the turbo PrintServer 20

Now you can work on SUN systems and open your business to the fast, network-efficient printing features of the turbo PrintServer 20. It's easy. Just install PrintServer Software for SUN SPARCstations and immediately you're offered:

- Duplex printing
- PostScript printing at speeds up to 20 pages per minute

- 70,000 pages per month duty cycle
- 1,500 sheet input and output capacity for up to 11-inch by 17-inch media
- 300 × 300 dpi resolution.

And what makes the turbo PrintServer 20 truly unique is built-in software that provides remote printer management, centralized job accounting, and access control.

Open to Other Possibilities

If you work on BSD-based UNIX platforms other than SUN SPARCstations, Digital also offers the easily installed PrintServer Source Kit for UNIX, Version 4.0. And better yet, since the PrintServer Software and Source Kit are completely compatible, your workstation can share the many features of Digital's powerful PrintServers with other same-LAN workstations, regardless of system differences.

Printing Options Made to Order

Call 800-344-4825, ext. 3566, to order or to get more information on

LA75 Plus Companion Printer
Order #LA75S-AA
\$749

Colormate PS Color Printer
Order # LP01U-CA for Mac-VMS
Environments
\$8,995
Order # LP01R-CA for VMS
Environments
\$9,450

PrintServer Software for SUN
SPARCstations Version 4.0
PrintServer Source Kit for
UNIX Version 4.0

NEW PRODUCTS

Development tools

Ewo Software has announced No Language Query (NLQ), a query tool for mainframes.

NLQ guides users through a query code-generation process without requiring knowledge of a particular query language, the company said. It can be used to select and sort records, create reports and extract files.

The cost of a permanent license ranges from \$12,000 to \$18,000.

Ewo Software
358 S. Walter Ave.
Newbury Park, Calif. 91320
(805) 498-8782

Application packages

Computervision has revised four add-on products for its Personal Designer computer-aided design (CAD) package.

The enhanced add-ons include Personal Designer/CADDS Direct Translator Revision 5.0 (\$2,450), Personal Designer DXF Revision 5.0 (\$295) and Personal Designer UPL Revision 5.0 (\$250). Each product allows the Personal Designer software to exchange data with other CAD formats. Personal Designer Data Extract Revision 2.0 (\$550), a report generator, has also been announced.

DOS-based versions of the products are available immediately; Unix versions will ship later in the year, the company said.

Computervision
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

Processors

Versys, Inc. has added the Model 700 minicomputer to its Solution/1 line.

The Model 700 is based on a scalable architecture supporting up to 128 users. It uses the Unix V.3 operating system and was designed for seamless connectivity to DOS environments, according to the company.

Pricing ranges from approximately \$150,000 to \$250,000, depending on the peripherals added.

Versys
400 Blue Hill Drive
Westwood, Mass. 02090
(617) 461-6400

Power supplies

Square D Co. has introduced a line of uninterruptible power supplies for mid-range computers.

The Topaz Series Three power systems range from 11 kVA to 80 kVA with battery capacity that users can select ac-

cording to their need. Each model includes an LCD display that monitors the status of all accessories.

Pricing ranges from \$20,900 to \$44,200.

Square D
9192 Topaz Way
San Diego, Calif. 92123
(619) 279-0111

Data storage

Ciprico, Inc. has expanded its Rimfire disk array line.

The new Rimfire 6610 product supports the largest and fastest drives available, according to the company. It offers

5.4G bytes of storage and 10M byte/sec. transfer rates. The Rimfire 6610 is a redundant array of inexpensive disks (RAID-3) product, including up to five drives; it allows hot-swapping in the event of drive failure. The product offers sector blocking/deblocking to maximize usable storage space.

Without drives, the unit costs \$15,395 in a desktop/rack-mount configuration.

Ciprico
2955 Xenium Lane
Plymouth, Minn. 55441
(612) 559-2034

Database management systems

BMC Software, Inc. has announced the

availability of Image Copy Plus Version 2.0.

The utility runs under IBM's IMS database for mainframes. It includes a number of enhancements such as Fast Path database support, the ability to create up to 10 multiple-image copies and improved I/O performance. The product can also invoke BMC's Pointer Checker Plus and Trimar Fast Path Analyzer programs to verify database validity within an Image Copy Plus job.

Pricing for a perpetual license starts at \$18,000.

BMC Software
P. O. Box 2002
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

INTERNATIONAL DB2 USERS GROUP

4th Annual

International Conference

"Target the Future — Managing Your DB2 Environment"

May 10-14, 1992

New York Hilton & Towers

IDUG Conference Brings Unduplicated Education and Networking Experiences to All Levels of DB2 Users

Beginning May 10 through May 14, 1992, the International DB2 Users Group (IDUG) builds on the experience and strengths of its three previous conferences to bring knowledgeable relational technology industry sources and technical education opportunities to the New York Hilton & Towers in New York City. The event is IDUG's 4th Annual International Conference, "Target the Future — Managing Your DB2 Environment." The value is an unprecedented selection of quality training sessions critical to productive and effective job performance.

Bringing together more than 1,800 DB2 users and suppliers from around the world, this major industry event features expert speakers and technical sessions geared to nine key levels of relational technology application and experience, including a new focus on Executive Development. They are:

- Systems Programming
- New DB2 Users
- Database Administration
- Application Development/ Data Modeling/CASE
- Distributed Technology
- Advanced DB2 Users
- Performance
- Decision Support/ Management

Other highlights are the new "Star Track" featuring speakers considered to be the best of the industry; an "Encore Track" offering second opportunities to hear favorite speakers; and, for the first time, "Exhibit Only" passes.

What Makes IDUG Conferences Worth the Investment?

IDUG is an independent, non-profit, volunteer-driven organization consisting of user, associate and vendor members. IDUG conferences stress objective, fresh presentations geared strictly to users, while vendor and IBM participation bring the conference full circle. Meetings of special interest groups, highly informative panel presentations, and an impressive display of new products and technology provide conference participants with unmatched take-home value.



Peer networking opportunities — among a strong international presence — are limitless. Just as important, the cost to attend is minimal; \$795 (before March 20) purchases a one year IDUG membership and full conference registration, including meals.

This year's keynote speakers include:

Jeff Tash, founder and president of Database Decisions, presenting "DB2 as a Foundation for IBM's Frameworks";

Earl Wheeler, senior vice president and general manager of Programming Systems for IBM, discussing IBM's newest composite applications, "The Information Warehouse Framework";

Colin White, founder and president of Database Associates International, presenting new information on "DB2 Interoperability"; and

Gabrielle Wiorkowski, founder and president of Gabrielle & Associates, presenting "Index Design, Joins, and Subselect Performance."



Return this coupon to the International DB2 Users Group, 401 North Michigan Avenue, Chicago, Illinois USA, 60611-4287 (FAX 312/321-6868), to receive information on user membership and IDUG's 4th Annual International Conference. For more information, call IDUG at (USA) 312/527-8777.

Name _____
Title _____ Company _____
Business Address _____
City _____ State/Province _____
Country _____ ZIP/Postal Code _____
Business Phone _____ FAX _____

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Token Ring Adaptors

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Best Service/Support	3Com
Best Documentation	IBM
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Ethernet Hubs

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Best Service/Support	3Com
Best Documentation	3Com
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Best Service/Support	3Com
Best Documentation	3Com
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Best Price/Performance	Synoptics Communications
Best Service/Support	IBM
Best Documentation	IBM
Prefer To Do Business With	IBM

Concentrators

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Best Price/Performance	Digital Equipment Corporation
Best Service/Support	Digital Equipment Corporation
Best Documentation	Digital Equipment Corporation
Prefer To Do Business With	Digital Equipment Corporation

Cabling Systems

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Best Price/Performance	AT&T
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer To Do Business With	AT&T

Gateways

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Best Price/Performance	AT&T & Digital Communications Associates (DCA)
Best Service/Support	AT&T
Best Documentation	Attachmate & Digital Communications Associates (DCA)
Prefer To Do Business With	AT&T

Network Management

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Best Price/Performance	Digital Equipment Corporation
Best Service/Support	Digital Equipment Corporation
Best Documentation	Digital Equipment Corporation
Prefer To Do Business With	Digital Equipment Corporation

Token Ring Hubs

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Best Price/Performance	Thomas-Conrad
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Best Price/Performance	Best Power Technology
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Peer-to-Peer Operating System

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Best Price/Performance	Artisoft's Lantastic
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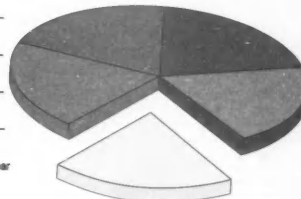
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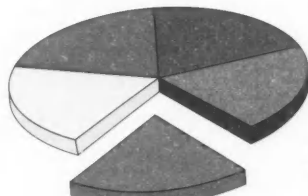


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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
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PRODUCT SPOTLIGHT

Accounting systems

As users demand quicker access to data, vendors try to gear up for a whole new way of doing accounting in the '90s

BY ROBERT CRANE

Accounting software for mainframes and minicomputers seems to be stretched about as far as it can go, with all the upgrades, add-ons and enhancements that have been performed since the 1980s' versions of these systems.

Companies that once sold pure financials (general ledger, accounts payable, accounts receivable) have added so many features that it's almost impossible to distinguish the accounting from the nonfinancial applications such as manufacturing, human resources, distribution and executive information systems (see story page 74).

But while there may not be much left in the way of new or substantially improved functions that vendors could add to their packages, the accounting system of the 1990s has yet to come.

According to accounting experts, this future system will sport a graphical user interface, function within a client/server architecture, operate effectively on a variety of platforms, improve internal business processes and support multiple accounting languages for global business operations.

To create such a system, the large systems vendors have a lot of revamping to do.

Time is of the essence

The big drive for this new type of accounting software comes straight from business users and their need for up-to-the-minute operational data.

"Accounting data used to be just a historical record of what happened to a company," says Sal Catania, New York partner of Big Six accounting firm Coopers & Lybrand. "But more and more managements are now using it as a means of running their companies almost on a day-to-day basis. In that environment, it is imperative that the data be current."

Crane, formerly editor in chief of *Accounting Today*, is a free-lance writer based in New York.



Philip Anderson

Most of today's mainframe-based (and thus batch-processing-oriented) systems don't offer access to data in real time. Data may be weeks old by the time it reaches the hands of users; this makes it quite limited for day-to-day management purposes.

Some companies are migrating to Unix- or personal computer local-area network-based systems to attain real-time reporting. However, both moves not only require a huge conversion effort and expense but also pose their own problems (see stories pages 75 and 76).

What the mainframe-oriented vendors are trying to do is move their current packages to a client/server architecture, which would allow users to access accounting records that are as current as the most recent en-

tries on the system.

Don't hold your breath waiting for these new capabilities, though.

As important as it is for the new type of system to appear, battle-tested versions of integrated client/server products are unlikely to be available for another two years or more.

What's more, the vendors that held top market spots in the 1980s (such as Software 2000, Inc., Dun & Bradstreet Software, Computer Associates International, Inc. and Global Software, Inc.) may not be the ones to deliver these new animals.

"A tremendous convergence is going on as mainframe, mid-range and personal computer vendors try to move their wares into the so-called 'open systems,' or client/server, type of

product," says Brian Sommer, director of software engineering at Andersen Consulting. "The battlefield right now is at the marketing level, with all the vendors trying to one-up each other with the next wave of terminology for the functions their new generation of products will support."

In the future

Sommer says he doubts the '80s generation of big vendors will have the agility to pioneer this next accounting software phase.

He reasons that because these top sellers are saddled with huge installations of customers on existing versions of their products, they may not be able, or willing, to move quickly into creating the new architecture-based products. That means that any user hoping to get to the next generation via an upgrade from his vendor may be out of luck.

When the first of these products do arrive, Sommer says, it is more likely that they'll be from the hands of smaller, more nimble competitors such as PeopleSoft, Inc., Oracle Corp. and SAP AG.

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INSIDE

Alternative Platforms

More people are considering Unix and PC-based systems. Page 76.

Buyers' Scorecard

D&B Software, CA tie in ratings of general ledger software. Page 78.

Product Guide

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Accounting systems for the '90s

CONTINUED FROM PAGE 73

But there are areas where the mainframe- and minicomputer-based vendors can stake a claim or two. One glaring weakness in the current systems is support for international operations. Because accounting terminology differs from country to country, corporate accounting departments with global operations need a system that supports multiple accounting languages.

Many of today's packages perform foreign exchange translations and also support compliance with FASB 52, a standard that dictates how currency conversion is to be accounted for and disclosed in financial statements.

But they need to go further than that. For instance, the vendors could build in support for national charts of accounts, which act as the framework of accounting systems and differ markedly from country to country.

Other ways to enhance international support is to better support promissory notes, bills of exchange and other transaction-related documents.

For example, some vendors offer one payables product for U.S. operations and a companion product for use in all other countries. What multinational companies need is a single master file.

Compatibility a key

Multinational companies — and domestic ones with multiple locations — also need a system that supports multiple platforms, since users often have difficulty standardizing their equipment worldwide, or nationwide, for that matter.

In fact, many companies say their biggest headache in keeping data as current as possible is the fact that their accounting systems run on diverse platforms. So far, vendors' claims of

multiplatform capabilities are far closer to fantasy than to reality.

Coda, Inc. comes the closest, with its accounting package that simulates support for multiple platforms. It can detect an intercompany transaction on a Digital Equipment Corp. VAX, automatically generate the appropriate intercompany accounting entries without user intervention, package the entries, send them over Decnet and post them on another VAX processor running Coda.

As impressive as that sleight of hand is by today's standards, it is a simple card trick compared with the demands of the marketplace as the '90s progress. As the decade progresses, multinationals in particular will be looking for even fancier tricks with

ter file used in accounts receivable, some serious "turf" questions will arise at some of the bigger companies. The personnel at one division will want the right to control certain master files. They may not care that people in other divisions of the company have the means to read those records; they only want the power to update the records.

Delegating responsibility

None of the software vendors have built into their applications a means of specifying which division or plant within a company holds responsibility for a given customer file. All the existing systems are based on an assumption of a single central source for such responsibilities.

So far, software vendors have

Where are your priorities?

Respondents rated the following accounting software features as 'important' or 'extremely important' for their companies now and for the future

Percent of respondents Base: 100 IBM systems sites in the U.S. (multiple responses allowed)		
	1991	1994
Client/server support	71%	81%
Windows user interface	23%	47%
Common user access across applications	63%	82%
E-mail integration	41%	60%
Spreadsheet/Analysis tools integration	58%	72%
EIS integration/features	28%	49%

Source: International Data Corp.

multiple platform-based operations.

Similarly, there are a lot of vendors promising to support distributed databases in the future. But since none have offered such a product before, they'll need to consider functional requirements that they've never had to deal with before.

For example, when managers want to split up a customer mas-

passed the buck on this issue to database vendors, suggesting that the problem belongs there. Or they have suggested that it can be dealt with as a security issue.

The latter approach would dictate that every customer be assigned to a specific employee with password access, a potentially chaotic solution for multidivision companies with tens of

thousands of customers.

While vendors work out distributed databases, there is another way to break the mold of accounting software: support business process re-engineering. This is one way vendors actually help companies find new and better ways to perform accounting functions.

The cost-cutting measures and downsizing forced on most companies during the past couple of years has caused top management at many big companies to reevaluate decades-old processes used in accounts payable and accounts receivable.

For example, to guard against fraud or costly processing errors, companies typically require accounts payable employees to go through a three- or four-step control process before an invoice is paid.

In this process, one employee matches the invoice to a purchase order. Another matches the invoice to a receiving document that confirms receipt of the requested item. Still another employee is responsible for ensuring that the item received meets the standards specified by the purchase order.

That's the basic procedure used by all of the existing accounting software packages for mainframes and minicomputers.

What's happening in the real world, though, is that some companies — under pressure to reduce costs — are finding that it may make sense to simplify that control process.

Ford Motor Co., for example, reduced its four-step procedure to just two steps. It now matches only the purchase order and receiving report and draws checks out of payables on that basis alone.

By and large, existing packages do not have the flexibility to permit users to easily re-engineer their processes. One exception to the rule is D&B Software, which offers an enhancement to its existing package that will permit a company to bypass standard procedures.

The fact of the matter is, IS managers looking for the new generation of accounting software for mainframes or minicomputers should take a cautious approach. Barring a miracle, it will be at least two years before any of the vendors produces a tested client/server product with multiple platform and multiple accounting-language capabilities.

In the meantime, companies will need to continue to look to add-ons and enhancements to improve the currency of their accounting data. ■

Beyond the bottom line

Accounting software has seen a lot of enhancements in the past couple of years. The following are among the major ones:

• **Consolidation packages:** For managers of companies with multiple divisions that need to quickly consolidate division-level results on parent company accounting systems, today's accounting products commonly incorporate high-quality consolidation packages. Two examples are IMRS, Inc.'s Microcontrol and CA's Consol.

• **Executive information systems (EIS):** To add a more friendly interface and also enable users to create more complicated, customized reports, vendors such as Software Plus, Inc. and Software 2000 have licensed Channel Computing, Inc.'s EIS for their Application System/400 accounting packages. Many mainframe vendors incorporate Comshare, Inc.'s EIS product into their accounting software.

• **Imaging capabilities:** Although most users aren't quite sure how they'll use it, at least one vendor — Computron Technologies Corp. — offers an accounting system with integrated imaging capabilities.

The most likely place for imaging in accounting systems would be in accounts payable and receivable. But most users say that before imaging becomes a fact of life, they'd have to re-engineer their business processes (see story page 73) to establish a more efficient work flow.

Even users who have purchased the Computron package say they're not quite sure yet how they'll implement the imaging component.

It will be several years before conclusions can be drawn about the extent to which imaging affects accounting department productivity or which types of businesses can make the best use of the function.

ROBERT CRANE

Making the choice

Basic accounting functions for mainframes and minicomputers do not differ a whole lot from package to package. So instead of evaluating software on its nuts-and-bolts capabilities, such as general ledger and accounts receivable and payable, many buyers first assess their companies' special needs and then match those with the peripheral functions on available software packages.

That's how Clay Kingsbery chose Coda's financial accounting software. Kingsbery is vice president and controller at Wasserstein Parella & Co., an international investment bank in New York. "We have about 30 legal entities, and keeping intercompany accounts straight is always a nightmare in this business. Coda's system has a feature under which we make an entry for one company, inform the system of where to make the entry for the other company, and the software automatically handles the intercom-

pany accounts," he explains.

Foreign exchange features also played a role in the decision. "Coda's software has what amounts to a full-function foreign exchange feature," he says. "For example, on a one-entry basis, we can simultaneously maintain separate sets of books for our overseas subsidiary in both dollars and in the local currency."

Other special needs include consolidation and inventories. The high quality of many of today's consolidation modules has helped multidivision companies reduce the lengths of the month-end closing process from weeks to days. Similarly, inventory record keeping, once the bane of many accounting departments, has been greatly simplified by improvements in inventory modules.

While the wish list should be as comprehensive as possible, don't expect to find everything you'd like. There is no such thing as the perfect accounting software package.

ROBERT CRANE

A (reluctant at first) move to Unix

Even at IBM sites, the move to Unix-based accounting systems is gaining momentum. In a recent survey of 100 such companies, 7% say they have some portion of their accounting systems on a Unix platform, and 21% expect to do so by 1994, according to Clare Gillan, an analyst at International Data Corp., a market research firm in Framingham, Mass.

Why the interest in Unix? It seems that people — even if reluctantly — are discovering some undeniable advantages to Unix-based accounting systems. To get to the heart of the matter, we asked Susan Boehlke, project manager at Atlanta-based Equitable Real Estate Investment Management, Inc., to recount how she and her staff decided to move off a mainframe-based accounting system and onto a Unix platform.

Unix was not even a consideration when we decided to replace our accounting applications three years ago.

Until the winter of 1989, our company had relied primarily on Wang Laborato-

Boehlke is project manager at Atlanta-based Equitable Real Estate Investment Management, Inc., a subsidiary of Equitable Life Assurance, Inc.

ries, Inc. VS300 and VS600 mainframe systems and an IBM 3090 to support our corporate applications, which included corporate accounting, property management and accounting, mortgage processing, word processing and electronic mail.

Like many companies, we recognized that this environment, and particularly the Wang mainframe applications, was not providing the best and most cost-effective solution for our end users.

That spring, we embarked on our search for the best accounting platform. Our project team — composed of accounting users and technical staff — evaluated applications such as general ledger, payroll, accounts receivable, accounts payable and fixed assets that were available on IBM mainframes, personal computer local-area networks and RISC System/6000 workstations, which IBM had just announced.

Delving in

On the surface, the evaluation bore no great surprises. As we expected, the PC LAN-based systems of that time were the most user-friendly, but they weren't sophisticated enough in their reporting and consolidation capabilities. We needed a system that offered a general ledger key with a complex organizational structure.

We found the same lack of sophistication in most of the 15 to 20 Unix packages that were available.

The surprise element occurred when we evaluated two exceptions in the Unix market — from Oracle Corp. and Lawson Associates, Inc. — that were geared toward larger installations.

Both met our needs just as well as the mainframe software we evaluated from Dun & Bradstreet Corp., Integral Systems, Inc. and Computer Associates International, Inc. Granted, the mainframe packages generally had some additional functionality, such as more sophisticated support of multiple currencies and customizable screens, but for our purposes, those features were irrelevant.

Icing on the cake

What is more, the team determined that Unix could actually give us an opportunity to improve our day-to-day operations, something we really didn't anticipate.

For one thing, the Unix applications offered the end user much greater control. One reason is that departments themselves can manage the resources on these smaller systems. That control and independence makes a big difference to accountants during critical times such as month- and year-end periods.

Users also gain greater control over prioritizing and scheduling jobs, including posting batches of transactions, running large reports such as trial balances and closing an accounting period.

A good example is check printing. In the mainframe world, the process for generating and printing checks typically requires an overnight batch process. In the Unix world, checks can be printed whenever the user wants them.

That's because the Unix applications assume that most processing occurs (or appears to occur) on-line instead of being batch-processed overnight.

Mainframe applications do try to compensate for the "overnight batch" con-

straints by adding functions such as "quick post" or "instant check"; however, those options solved only a small part of our problem.

Also, the mainframe vendors couldn't match the Unix user interface. The mainframe applications were typically designed with the look and feel of a 3270 terminal. When the vendors added pseudo-PC features, or PC front-end programs, the solutions seemed "tacked on."

THE SURPRISE ELEMENT occurred when we evaluated two exceptions in the Unix market that were geared toward larger installations. Both met our needs just as well as the mainframe software we evaluated.

For example, some PC programs offer ease-of-use features or color enhancers for entering a batch of checks. But the system still needs to access the mainframe to get those added features, which, in the end, doesn't change the fundamental processing.

Shifting control from the data center to the end users was no easy task. It was difficult to give up the security of data center control, expertise and support, es-

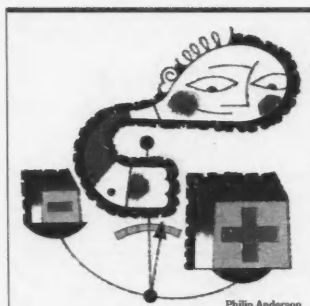
pecially since we hadn't determined how to structure the appropriate controls and support in a Unix environment.

We were also somewhat uneasy about the technical and business risks associated with Unix-based software. At the time of our evaluation, the RS/6000 and IBM's commitment to open Unix systems was unproven. The Unix software vendors tended to be smaller and newer than the mainframe vendors, and they didn't have an existing customer base in the RS/6000 world.

Cost and implementation time finally tipped the balance in favor of Unix. We just could not justify the mainframe's significantly greater cost, even when we factored in the resources required to manage the departmental RS/6000 implementation. We decided to go with Lawson Associates' Unix-based accounting system because it was one of the only systems that offered management tools at that time.

We have been using the Unix-based system since the summer of 1991. Our first year-end processing on the new system was quite an improvement over the mainframe system. In fact, the accounting department, which previously had lower priority on the mainframe system, completed their year-end processing before any other department, without the usual overtime and weekend work that is often required.

Overall, we are very satisfied with our decision to move to Unix, and our users are happy using our "own" systems.



Philip Anderson

Strengths

- + Operates in real time rather than batch mode. That means reports and documents such as checks and invoices are available upon user request.
- + Good price/performance.
- + Management of machine resources and peripherals moved to end users.
- + User-friendliness.
- + Cooperative processing.
- + Quick installation.

Weaknesses

- Possibility of network bottlenecks.
- Potential for insufficient functionality. May be lacking in printing font options, text editors, report writers, etc.
- Fewer security options.
- Some modules may not be available, such as general ledger, accounts payable, accounts receivable and fixed assets.

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PC-based accounting software sparks interest in downsizing

BY HOWARD MILLMAN

Faced with end-user demands for quicker access to accounting data and top management pressure to lower costs, many information systems managers are starting to at least consider downsizing to personal computer, local-area network-

Millman is a consultant in Croton, N.Y., who implements engineering and project-tracking applications for universities and hospitals.

based accounting packages.

The number of people actually planning that type of conversion is small; a recent study by Framingham, Mass.-based International Data Corp. found that only 3% of 100 IBM sites planned to move their general ledger systems from the mainframe to the PC.

But what has IS managers in midsize and even large firms interested in distributed accounting systems is the functionality being touted in PC-based software.

Today's high-end PC applications have taken great strides beyond their predecessors, which traditionally handled only a small number of general ledger accounts, five- or six-digit code lengths and 5M- to 10M-byte databases.

A look at a general ledger module from Armor Systems, Inc. shows how times have changed. It can generate profit-and-loss statements for up to 1,200 departments, track 32,700 employees and accommodate an infinite number of current and archived journal entries.

That kind of capacity is becoming the norm on LAN-based software. Transaction size has grown to \$1 billion on applications from Open Systems, Inc., Macola, Inc. and Realworld Corp. Even one of the smallest systems, from American Busi-

ness Systems, Inc. in Chelmsford, Mass., handles transactions up to \$100 million. Advanced Business Microsystems, Inc.'s Platinum aims higher — \$100 trillion.

Many PC packages also offer report writers, audit trails, the ability to custom-format financial statements and file-import capabilities.

What's really attractive is that these mainframe-quality features are available for a lower purchase and maintenance cost. Most accounting software that runs on a DOS- or Unix-based PC LAN with a PC or workstation-level server costs between \$500 to \$1,000 per module, with some special-purpose modules ranging up to \$2,500.

Experts warn, however, that installation, training and maintenance support can inflate the first year's total cost to \$20,000 or more.

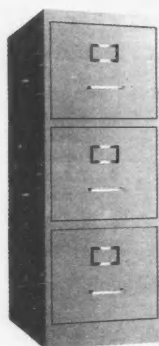
There are also conversion costs to consider. Some companies do offer automatic conversion services using custom-written conversion routines. Microvar, a reseller for Open Systems in Minneapolis, charges between \$2,000 and \$4,000 to extract data from a mainframe and transfer it to a LAN-based system.

Small benefits

In theory, PC-based systems can be considered by all but the largest firms, analysts say. "The only important differences between mainframe, mini and micro systems is in the degree of integration and the amount of data storage," says David Wess, a certified public accountant and partner at Pollan, Manner and Wess, an accounting and financial systems consulting firm in Scarsdale, N.Y.

"You may need a mainframe if you have absolutely staggering storage needs," Wess notes.

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Provides a 256-page guide — *Guide to Accounting Software for Microcomputers* — comparing 18 leading midrange to high-end accounting packages. The guide costs \$395 or \$505 with one update.

The Requirements Analyst is composed of a Lotus Development Corp. 1-2-3 template of 800 features typically contained in accounting software. Users identify required features, and Requirements Analyst checks the database and provides a list of packages best suited to the task.

Solutions, Richmond, Va.
(804) 794-3100

Offers The Accounting Library, analysis software that helps users choose software packages by comparing their needs with an 80-product database. Users define their needs (in order of importance) from a list of more than 900 features, functions and reports spread over 10 accounting modules.

The software costs \$279 to \$379, with six months of free updates. Subscription fee is \$100 per year.

Integration among platforms is another consideration. "Especially in specialized vertical markets," Wess continues, "you can't get PC software to integrate with the primary applications. Then that becomes your deciding factor."

Otherwise, he says, you can more economically obtain mainframe features from high-end PC LAN software vendors.

One of Wess' clients, a Manhattan, N.Y., real estate developer, "used a \$20,000 System/36-based custom accounting package that only the office guru could operate. Today, using accounting software from Realworld, they now have more features, functionality and users than before for less than \$5,000."

One step at a time

Just the same, Wess and many other experts caution IS professionals to approach downsizing accounting applications incrementally, from the mainframe to the minicomputer and then from the minicomputer to the PC.

"Let the application drive your decision for what hardware to run it on," cautions Jim Brust, a manager at Arthur Andersen's Application Software Division. "First, consider what other applications financial software has to integrate with and what platforms they're available on."

Brust adds that while minicomputer-based systems are somewhat more expensive than PC-based packages — priced at about \$15,000 — that price includes network-ready, high-transaction, high-volume software often integratable with the enterprise's other primary applications.

"I see a lot of mainframe-level functionality now available on AS/400 networks," Brust says. "Less overhead, fewer personnel, relaxed environmental

The following products are among the best-selling high-end PC accounting packages



- * Advanced Business Microsystems, Inc. Irvine, Calif. Platinum
- * Computer Associates International, Inc. Garden City, N.Y. Accpac Plus
- * CYMA Systems, Inc. Tempe, Arizona Professional Accounting Series
- * Great Plains Software Fargo, N.D. Accounting Series
- * Macola, Inc. Marion, Ohio Macola accounting software
- * Open Systems, Inc. Eden Prairie, Minn. Open Systems accounting software
- * Realworld Corp. Concord, N.H. Realworld series
- * SBT Corp. Sausalito, Calif. SBT series
- * Solomon Software Findlay, Ohio Solomon III
- * State of the Art, Inc. Irvine, Calif. MAS 90

Source: Computer Training Services CW Chart: Marie Haines

requirements and equivalent functionality at a lower cost make the price-per-user very attractive."

Even the vendors agree that the size of the system can dictate its functionality. "You really can't make a single accounting system rich in features and keep it simple," says Paul Lancey, vice president of Computer Associates International, Inc.'s Micro Products Group. That's why CA offers different packages for DOS, Unix and VMS operating systems.

Mallinckrodt Chemical Specialties is

one firm that took the minicomputer option. Using CA's Accpac Plus, it moved its accounting system from an IBM 3083 to an international distributed system of PC LANs and Application System/400s. The new system lowered response times and costs even more than what was planned while increasing functionality on the mainframe.

"We agreed to provide a response time of 2½ seconds from the time a user hit a key to when they got their answer," says Phil Soto, manager of IS. "We're running at 1½ seconds."

Conversion costs were high, but the company was able to amortize the amount over two years, says Dallas Wilkinson, director of information services.

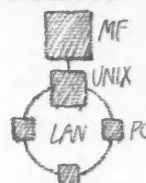
Beyond features and functionality, customers of accounting systems also want a guarantee that their data won't be compromised and they won't be left hanging when there's trouble with the system.

"Accounting software is the most critical piece of software that a company has," says JoBeth McCann, vice president of systems and development at London and Bishopgate International, a financial asset management company.

In recognition of this, vendors of mid-range to high-end PC LAN-based software all offer extensive after-sales support. This includes toll-free, technical-support numbers, on-site instruction, customization, regional training classes and local value-added resellers (many of whom are accountants) available as advisors and troubleshooters.

McCann recently selected accounting software from Systems Union, Inc. "I look at all our software suppliers as our business partners. They must be the kind of people who will work with us, support us and help us to reach our goals." ■

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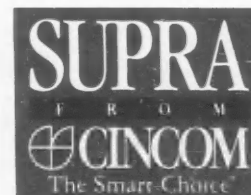


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'If I could make three changes'

BY JIM JOHNSTONE



As part-time chief financial officer at a number of firms, I typically spend one day a week at each of four companies, working with lots of accounting systems firsthand. What

I find ironic is that while the businesses are very different from one another and use different accounting software packages, the headaches are surprisingly similar. The reason for the similarity, I believe, is that accounting systems were developed around the needs of the data, not the people using them.

Good software should support and enhance a worker's mental processes or natural work flow. The designer should foresee the worker's needs — understand how the worker thinks when he performs a task — so that the task can be completed without leaving the software.

Instead, accounting departments still keep a lot of data off-line. Even though the needed data exists somewhere in the accounting system itself, people always need to refer to off-line worksheets, logs, analyses, checklists and reports.

Consider the printed charts of accounts and the vendor and customer lists

that for years people just tacked up on the wall by their computer. Now, finally, we have pop-up, on-screen searching of existing general ledger accounts and vendor and customer names.

Accounting vendors should take a lesson from computer-aided design and drafting tools and computer-aided software engineering. Now, I'm no mechanical engineer or software programmer, but I have seen firsthand how those tools are revolutionizing the way people work. Those tools provide a rich environment

ACCOUNTING systems were developed around the needs of the data, not the people using them.

that leverages the brainpower of a user at each step of his work.

What we need is CAA — that is, computer-aided accounting. CAA would begin with a good, intuitive interface and end with powerful help that borders on artificial intelligence.

To be worthy of the name, CAA tools would have to provide a nearly complete environment for data-entry clerks, accountants and financial executives to do big chunks of their work.

To create this environment, develop-

ers will need to understand the work flow step by step. There's no better way for software developers to find out what tools we need than to follow us around and note what we actually do.

For a start, speaking for all CFOs, I suggest three fruitful areas:

► The first is easy and concrete. I have trouble giving consistent treatment to transactions. For instance, when an invoice comes in, I have no way of knowing if it's been prepaid. Do I expense it or take the accrual off the balance sheet?

While most companies have procedure books for this sort of thing, what I could really use is some sort of built-in Help system that will demonstrate how a similar transaction has been handled so I don't have to interrupt what I'm doing to look up past instances.

► The second need is more difficult. I want to throw out my "how-to" checklists for routine processes, such as adding an account, closing a month or voiding a check. I would like my software to guide an untrained person, perhaps by "learning" from previous times.

► The third is really complex. I need to find a much better way to make people in marketing, manufacturing and operations into direct users of my accounting systems. When the departments have partially overlapping systems, we all waste time, and we often fail to see how the business as a whole fits together.

Basically, what we need is software that coddles and pampers the way we think and work instead of forcing us to organize our work around the demands of the software. ■

Johnstone is president of Johnstone Co. in Manchester, N.H., and a part-time chief financial officer, specializing in emerging ventures in computer hardware and software and biotechnology.

BUYERS' SCORECARD

CA's and M&D's general ledger systems on a par

BY DEREK SLATER
CW STAFF

According to the people who know them best, there is very little difference in the overall quality of the top mainframe general ledger systems. Software from Computer Associates International, Inc. and Dun & Bradstreet Software's M&D unit finished with equal scores in *Computerworld's* Buyers' Scorecard. Right behind the two leaders were packages from Global Software, Inc. and D&B Software's MSA unit, each earning an overall score of 63 to the winners' 64.

The total score for each product reflects a higher level of satisfaction than in a similar Buyers' Scorecard conducted two years ago [CW, May 7, 1990]. The 1992 mean score of 64 is up four points from the 1990 mean of the same products.

Each user group rated only its own product, assigning a 1-to-10 score for each of the 20 performance areas, with 10 being very good. Users also rated the importance of each category. Overall scores were determined by multiplying the mean ratings each user group gave its product by the mean importance factors assigned to the criteria by all respondents. Scores were then converted to base 100. The response base for the survey was 30 users for CA and Global, 48 for M&D, and 52 for MSA.

For CA, the final tally marks a turnaround from a last-place score in the 1990 Buyers' Scorecard. The overall score of 64 is six points higher than the 1990 result of 58 (score converted to






base 100 for comparison). The company has worked on integrating its general ledger code with its databases and reporting tools since the previous Scorecard, and that effort seems to have paid off: The product achieved a first-place ranking in database interface in the current survey, compared with a fourth-place finish in that category in 1990.

CA earned its highest ratings for providing a full range of functions (7.3) and providing enterprise tracking (7.3).

Some M&D and MSA customers expressed concerns about the impact of the 1990 merger of McCormack & Dodge and Management Science America, Inc. into the single D&B Software company. Ten M&D users and 12 MSA users indicated that their level of satisfaction has declined. The primary reason cited for decreased satisfaction was service concerns. Nonetheless, M&D's service climbed from 6.0 in 1990 to 6.6 in the current Scorecard. MSA's service and support rating rose from 6.3 in 1990 to 6.6 this year.

The highest scores for M&D came in range of functions (7.7), meeting current business needs (7.5) and providing effective training (7.3). MSA's highest scores came in the areas of providing a full range of functions (7.2) and ability to meet current business needs (7.1).

For Global, which finished first in the previous Scorecard, first-place marks in key categories were offset by last-place finishes in a number of other areas, such as range of functions (7.0) and ease of use (6.4). Among Global's blue ribbons were overall performance (7.2) and service and support (7.1). Global's overall rating of 63 remained constant. •

 Mainframe general ledger software <i>Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance.</i> <i>Response base: CA: 30; M&D: 48; Global: 30; MSA: 52</i>		
Product vendor	Highest ratings	Lowest ratings
Computer Associates 	Provides a full range of functions Provides enterprise tracking Ability to meet current business needs	Provides graphical analysis features Provides expert system functions Ease of customization
D&B Software's M&D 	Provides a full range of functions Ability to meet current business needs Provides effective training	Provides graphical analysis features Interface with database management features Adaptability to distributed technologies
Global Software 	Ability to meet current business needs Overall performance Service and support	Provides graphical analysis features Adaptability to networking Adaptability to distributed technologies
D&B Software's MSA 	Provides a full range of functions Ability to meet current business needs Integration with other accounting modules	Provides graphical analysis features Adaptability to networking Ease of customization

KEY RATINGS

Reflecting the close overall scores, three of the six key categories feature ties for top honors. Global and M&D split top billing in the most important category: ability to meet current business needs. Global earns two clear firsts, along with two shared firsts.

User importance rating:

9.0 Ability to meet current business needs

Global	7.5
CA	7.2
MSA	7.1

8.6 Service and support

Global	7.1
CA	6.7
MSA	6.6

8.5 Provides availability and recovery from crashes

Global	6.8
CA	6.8
MSA	6.6

8.4 Overall performance

Global	7.2
M&D	7.1
CA	6.9
MSA	6.6

8.3 Provides a full range of functions

M&D	7.7
CA	7.3
MSA	7.2
Global	7.1

8.2 Overall ease of use

CA	6.8
M&D	6.8
MSA	6.5
Global	6.4

A CLOSER LOOK

In the 14 remaining areas, Computer Associates wins seven times, while MSA ties for first in providing custom report generation.

User importance rating:

8.1 Provides custom report generation

MSA	6.8
CA	6.6
Global	6.3

7.9 Reasonably priced installation and maintenance

Global	6.2
CA	6.1
MSA	5.6

7.9 Provides effective training

Global	7.1
MSA	7.1
CA	5.9

7.7 Integration with other accounting modules

MSA	7.1
Global	6.8
CA	6.4

7.7 Ease of installation

CA	7.0
MSA	6.5
Global	6.3

7.2 Ease of customization

Global	5.8
CA	5.4
MSA	5.2

7.1 Integration with nonaccounting modules

MSA	6.2
CA	5.8
Global	5.3

7.1 Adaptability to tax system changes

Global	6.9
MSA	6.8
CA	6.7

7.0 Provides enterprise tracking

CA	7.3
MSA	6.5
Global	6.3

6.7 Interface with DBMSs

CA	6.2
MSA	5.5
Global	5.4

6.6 Adaptability to networking

CA	6.3
MSA	5.0
Global	4.9

6.4 Adaptability to distributed technologies

CA	5.6
MSA	5.3
Global	5.0

6.4 Portability of programming language

CA	6.4
Global	6.4
MSA	5.9

5.8 Provides graphic analysis features

CA	4.7
Global	3.8
MSA	3.8

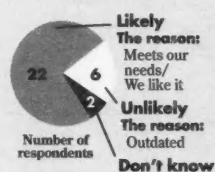
Loyalties

Would you buy the product again?

(Reasons based on most frequently stated answer)

CA

Response base: 30



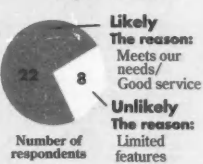
M&D

Response base: 48



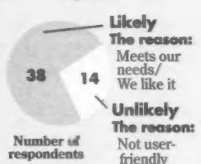
Global

Response base: 30



MSA

Response base: 52



General ledger software

U.S. market share 1991
(Based on number of installations)



Source: Computer Intelligence

METHODOLOGY

Products covered in this Buyers' Scorecard are the Top 4 mainframe general ledger software packages in terms of market share.

The survey was based on random samples of users drawn from nonvendor sources. First Market Research in Austin, Texas, conducted the telephone survey and tabulated the results.

The total weighted scores were computed by multiplying the mean importance score users assigned each criterion by the mean score each user group gave its own product. Ratings are presented in order of importance based on these mean importance ratings.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance in preparing this Buyers' Scorecard: Computer Intelligence/Infocorp; Clare Gillan, International Data Corp.

Verbatim

What do you like best/least about this product?

(Responses based on the most frequently stated answer)

CA

Likes

Meets our needs
Functionality
Flexibility

Dislikes

Difficult to interface with other packages
Too complex
Needs updating

M&D

Likes

Flexibility
Functionality
Reliability

Dislikes

Too complex
Difficult to interface with other packages
Slow

Global

Likes

Flexibility
Ease of use
Functionality

Dislikes

Too complex
Difficult to interface with other packages
Poor reporting

MSA

Likes

Functionality
Flexibility
Reliability

Dislikes

Difficult to interface with other packages
Too complex
Poor reporting

Integrated accounting software for minis

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	HARD DISK (BYTES)	MEMORY REQUIRED (BYTES)	ACCOUNTING FEATURES	ADVANCED FEATURES	CUSTOMIZABLE MENU	CASE TOOLS INCLUDED	SOURCE CODE CAPABILITIES	INTEGRATED WITH EDI	REPORTS GENERATED	OTHER APPLICATIONS PRODUCT INTERFACES WITH	SECURITY FEATURES	NETWORK SUPPORTED	PRICE
Advanced Computer Systems for Printers (503) 792-6779	Printers' Accounting and Information Systems (PAIS)	VAX, DG, 80386, 1486-based machines	VMS, Unix, AOS/V5	50M	8M minimum	AP, AR, GL, inventory control, order entry, payroll, purchasing, fixed assets, job costing, estimating sales analysis, scheduling, production control, data collection, finished goods inventory	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password, data field	Novell, TCP/IP	\$15,000
Affinity Software (805) 642-3990	Affinity Software Accounting System	AS/400	OS/400	40M	4M	AP, GL, budget maintenance, payroll, unit analysis	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, agricultural accounting, deferred revenue and expenses	No	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Word processor	Audit trail	None	\$7,500 per application
American Software (404) 264-5296	Integrated Financials	AS/400, RS/6000 or plus-compatible	OS/400, MVS, VSE	100M	Dependent on number of users	AP, AR, GL, inventory control, order entry, purchasing	Tables for state and federal income tax, cash management/check writing, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	None	Audit trail, password	CICS	\$40,000 - \$400,000, depending on architecture and platform
Bi-Tech Software, Inc. (916) 891-8381	Interactive Fund Accounting System (IFAS)	HP 3000, HP 9000, RS/6000	HP-UX, AIX	1G or higher	1M per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, human resource, position control, nucleus (security), person entity, check management, encumbrance, smart database	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor, EIS	Audit trail, password	TCP/IP, Novell links	\$27,500 - \$96,250
Brewer & Co. (617) 275-5810	Business Information System	VAX	VMS	200M-500M	1M-2M per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, Manpower Planning	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor	Audit trail, password, user name	Decnet	\$10,000 and up
Calibus Systems, Inc. (617) 684-1200	Miracle Financial System	VAX	VMS	User-dependent	User-dependent	AP, AR, GL, budget maintenance, inventory control, order entry, purchasing, fixed assets, project accounting, purchase-order processing	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password	Decnet	\$7,000 per module starting price
Chris Schaefer & Co. (713) 558-3373	Pilot Integrated Accounting System	HP 3000, Spectrum	MPE-V, MPE-XL, MPE-X	40M	4M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, human resources, work order, job cost	Tables for state and federal income tax, check writing and printing, multicurrency, simultaneous cash and accrual basis accounting	Yes	No	No	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password	Novell	\$5,500 - \$15,500 per module
CMI Competitive Solutions, Inc. (617) 957-4444 (800) 727-2541	Trans4M	HP 3000, HP 9000, DEC System 5000, RS/6000, Sequent Symmetry, DG Avion	Unix	800 minimum	32M minimum	AP, AR, GL, inventory control, order entry, payroll, purchasing, sales analysis, billing, product costing	Tables for state and federal income tax, cash management/check writing, multicurrency, automatic accrual of unvoiced liabilities	No	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis	None	Audit trail, password, each menu option can be selectively secured based on log-on and password	None	\$12,600 starting price for eight users
Cwib, Inc. (800) 647-0600	Integrated Accounting System	VAX, AS/400	VMS, OS/400	4.5C (VAX), 1G (AS/400)	32M (VAX), 8M (AS/400)	AP, AR, GL, budget maintenance, inventory control, purchasing, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, password, encryption	Decnet	\$35,000 - \$350,000
Compuserve/Collier Jackson (613) 872-9990	World Class Series accounting and Human Resource Software	HP 3000, HP 9000, VAX, RS/6000	MPE-X, HP-UX, VMS, AIX	User-dependent	User-dependent	AP, AR, GL, budget maintenance, payroll, purchasing, fixed assets, personnel	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency, reporting, customizable screens, multicurrency accounting	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor, EIS	Audit trail, password, encryption	TCP/IP, Novell, LAN, Ethernet	\$13,000 - \$65,000, depending on modules and platform
Computer Associates International, Inc. (516) 343-5234	Masterpiece	AS/400, System/38, VAX	OS/400, C/P, VMS	Platform-dependent	Platform-dependent	AP, AR, GL, budget maintenance, inventory control, order entry, purchasing, fixed assets, project accounting, job cost, fund accounting, collection management	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, multicurrency, multi-language, cooperative processing, user-defined fiscal calendar	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, EIS	Audit trail, password, screen, field and data sensitivity	DDM, Decnet	\$2,600 - \$44,100
Computer Design Systems, Inc. (612) 559-7459	Adviser Business Management Tools	RS/6000, Mips, Everset, Tricord	SCO Xenix, Unix System V, SCO Unix	5M	4M-8M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, multicurrency, multiple checking/banking accounts	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor	Audit trail, password	None	\$5,000 - \$15,000

*Accounts payable, accounts receivable, general ledger.

All products have public and private mailing lists.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

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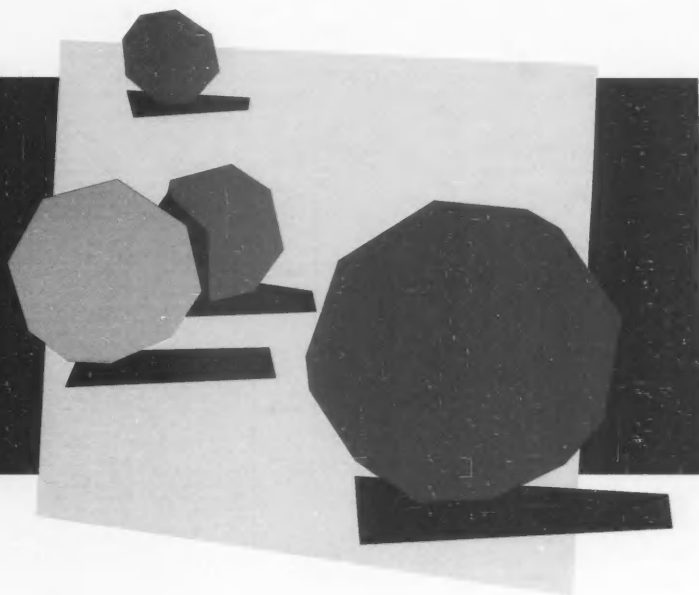


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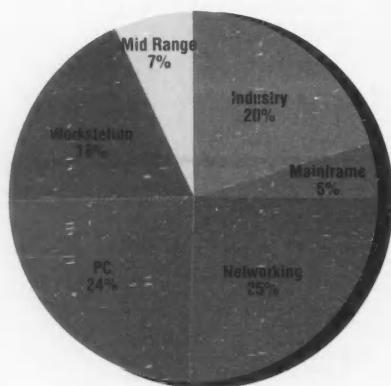
ACCOUNTING SYSTEMS PRODUCT SPOTLIGHT

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	HARD DISK (BYTES)	MEMORY REQUIRED (BYTES)	ACCOUNTING FEATURES	ADVANCED FEATURES	CUSTOMIZABLE MENU	CASE TOOLS INCLUDED	SOURCE CODE CAPABILITIES	INTEGRATED WITH EDI	REPORTS GENERATED	OTHER APPLICATIONS PRODUCT INTERFACES WITH	SECURITY FEATURES	NETWORK SUPPORTED	PRICE
Computerics, Inc. (404) 634-6575	Computerics Fund Accounting System	AS/400, VAX	OS/400, VMS	500M	1M per user	AP, AR, GL, budget maintenance, inventory control, purchasing, fixed assets, project accounting, financial modeling	Across the program data lookup or browsing, multicurrency	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet	Audit trail, password	Decnet	\$75,000-\$350,000, depending on platform and modules
Computron Technologies Corp. (201) 935-3400	N-dimension	VAX, AS/400, RS/6000, Wang VS	VMS, OS/400, AIX, Wang VS	Configurable	Configurable	AP, AR, GL, budget maintenance, inventory control, purchasing, fixed assets, project accounting, time and materials accounting management	Cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency, image integration, multiple structures, calendars, multilingual, work-flow management, fax integration	Yes	Yes	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS, imaging	Audit trail, password, encryption	Decnet	\$20,000-\$80,000 per module
Concept Dynamic, Inc. (708) 397-1044	The Control Series	HP 9000, NCR 3000 Series, Sequent Symmetry, DG Avision, RS/6000, Decstation	Unix, SCO, HP-UX, AIX, Ultrix	150M	5M per user	AP, AR, GL, budget maintenance, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, across the data lookup or browsing, calculator, multicurrency	Yes	Yes	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, EIS	Audit trail, password	Novell, Decnet, TCP/IP, Ethernet	\$10,000 starting price
Cosmetic Software Systems, Inc. (512) 225-5185 (800) 541-4580	C/Books Accounting	Bull DFX/2, AT&T's 3B2, NCR Tower, RS/6000, IBM PCs and compatibles	Unix, Xenix, AIX, Ultrix, MS-DOS	10M	500K per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, job costing	On-Line processing, customizable accounting	Yes	Yes	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis	Spreadsheet	Audit trail, password, log facility	None	\$695 starting price per module for one user system
Datanax of Santa Barbara (805) 682-3442	Unique VI Accounting/Route Management	Any Unix-based machine ported to by Unix	Unix, Xenix, AIX, Sparc, RISC	100M	4M-6M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, multiwarehouse	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency, database-driven, fully integrated	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, password, encryption	None	\$10,000 starting price
Datanax International, Inc. (801) 226-2200	Transact	80386- and 486-based machines, Sequent Symmetry, HP 3000, HP 9000, RS/6000, NCR Towers, Nixdorf, Aris	Unix	40M	750K per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, multicurrency	Yes	Yes	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor	Audit trail, password, encryption	TCP/IP	\$50,000-\$250,000, depending on number of users
Dun & Bradstreet Software (508) 370-5000	Millennium Applications	VAX	VMS	1M minimum	16M minimum	AP, AR, GL, inventory control, purchasing, fixed assets, capital projects	Cash management/check writing, across the program data lookup or browsing, text editor, multicurrency	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, password, encryption, field level	Pathworks, 3Com, Novell, any Netbios-compatible	Contact vendor
Emphasys Software, Inc. (612) 941-9337	Financial Manager Series	IBM PCs and compatibles, PS/2, RS/6000, NCR Tower, AT&T 3B2	DOS, Unix, Xenix, AIX, SCO 80286, SCO 80386, Interactive 38, SCO V/386, OS/2	30M	640K	AP, AR, GL, budget maintenance, payroll, purchasing, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	None	Audit trail, password, encryption, built-in user management	Novell, Vines, 3Com	\$3,000 per module
Genesis Total Solutions, Inc. (205) 252-9446	Ledger/3000	HP 3000	MPE	50M	1M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, production control	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, on-line Help, security control	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, password	None	\$25,000 starting price for system; \$5,000 starting price per module
Global Software, Inc. (919) 872-7800 (800) 326-3444	General Ledger, Accounts Payable, Accounts Receivable	AS/400	OS/400	85M	8M	AP, AR, GL, budget maintenance, credit management	Cash management/check writing, across the program data lookup or browsing, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, EIS	Audit trail, password	Token Ring, Ethernet	\$35,000-\$70,000 for GL; \$25,000-\$50,000 for AP; \$35,000-\$65,000 for AR
Hughes Berube, Inc. (207) 774-0540	HBI Integrated Accounting Packages	Data General, Unix	AOS/VS, Unix	10M	256K	AP, AR, GL, budget maintenance, payroll	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, multicurrency	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet	Audit trail, password	None	\$10,500 per module
Integral Midrange (510) 839-3990 (800) 824-8199	Accounts Payable, Accounts Receivable, General Ledger, Fixed Assets	AS/400	OS/400	40M minimum	Varies with transaction volume	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, multicurrency	Yes	Yes	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor, EIS	Audit trail, password, encryption	Any connectivity to AS/400	Contact vendor
Interactive Information Systems (602) 780-4214	Computer Interactive Integrated Manufacturing	Any Unix-based machine, VAX	Unix, VMS	Platform-dependent	Platform-dependent	AP, AR, GL, budget maintenance, inventory control, order entry, purchasing, project accounting, MBR II	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, multicurrency	Yes	Yes	Yes	Yes	All financial statements	E-mail, spreadsheet	Audit trail, password	TCP/IP	\$21,000-\$630,000, depending on platform and number of users
Kennedy and Associates (804) 288-7622	APPX	RS/6000, HP 3000, HP 9000, VAX, Wang VS	AIX, HP-UX, VMS, VS/OS	90M	512K-1M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, sales analysis, federal magnetic media	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency, multicurrency, on-line Help, 4GL-based	Yes	Yes	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password	None	\$1,900 starting price per module

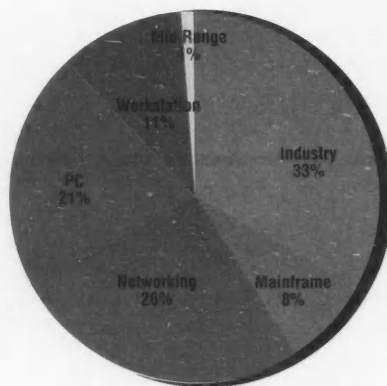
ACCOUNTING SYSTEMS PRODUCT SPOTLIGHT

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	HARD DISK (BYTES)	MEMORY REQUIRED (BYTES)	ACCOUNTING FEATURES	ADVANCED FEATURES	CUSTOMIZABLE MENU	CASE TOOLS INCLUDED	SOURCE CODE CAPABILITIES	INTEGRATED WITH EDI	REPORTS GENERATED	OTHER APPLICATIONS PRODUCT INTERFACES WITH	SECURITY FEATURES	NETWORK SUPPORTED	PRICE
Lawson (612) 379-2633 (800) 477-1357	Lawson Accounting System	IBM 3090, IBM 4300, AS/400, RS/6000, HP 3000, HP 9000, DEC systems, Sequent, Unisys A, Unisys U series	OS/400, AIX, HP-UX, Ultrix, Dynix/PTX, Unix System V, DMS2	Hardware-dependent	Hardware-dependent	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, multicurrency	Yes	Yes	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, EIS	Audit trail, password	None	\$18,000 starting price
Liberty Business Systems, Inc. (801) 566-9324	Freedom II	IBM PCs and compatibles, AT&T 3B2, RS/6000, HP 3000, HP 9000, VAX, DG Avion, Motorola 8000, Prime EXO, Sequent, Sun Sparcstation	DOS, Xenix, Unix, AIX, HP-UX, VMS	10M	640K	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, prospect management	Tables for state and federal income tax, across the program data lookup or browsing, pull down menus, windowing, generic searches, uses Progress 4GL and RDBMS development environment	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Word processor	Audit trail, password	Novell, Vines, Decnet, any Netbios-compatible gear	\$695-\$1,995 per module, depending on platform
MCBA (818) 242-9600	Classic	IBM PCs and compatibles, VAX, HP 3000	DOS, VMS, Unix	40M	615K per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, manufacturing	Tables for state and federal income tax, across the program data lookup or browsing, calculator, text editor, multicurrency	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	None	Audit trail, password	Novell	\$1,000-\$5,000 per module
Mitchell Humphrey & Co. (314) 991-2440 (800) 237-0028	Mitchell Humphrey & Co. Financial Management Systems	HP 3000	MPE, MPE-IX	Application-dependent	Application-dependent	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, fund accounting, consolidation, budget preparation	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, multicurrency, encumbrance accounting, FMS Exec	No	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, password, encryption, secured by function and account number	NP	\$15,000-\$250,000 purchase price, depending on modules
MKS, Inc. (215) 941-6970	Midas	VAX, HP 3000, HP 9000	VMS, Unix	300M	1M per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, return authorization, product control	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, multicurrency, bar code, automatic picking equipment	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, privileges authorization	Any	\$50,000 - \$200,000
Multiview Corp. (617) 222-2225	Multiview Financials	HP 3000	MPE-V, MPE-IX	Application-dependent	NA	AP, AR, GL, Budget maintenance, purchasing, fixed assets, project accounting, commitment accounting, Multilink	Cash management/check writing, across the program data lookup or browsing, custom forms design	No	No	No	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, EIS	Audit trail, password, operating system security	None	\$2,000-\$100,000 purchase price, depending on modules
Oracle Corp. (415) 506-7000 (800) 367-3461	Oracle Financials	Amdahl UTS, AT&T Pujisa, HP 3000, HP 9000, Motorola 8000, VAX, DG Avion, RS/6000, NCR 3000, Sun 3, Sun 4, Prime Pyramid, Sequent, Stratus	Unix, Ultrix, VMS, HP-UX, AOS/VS, MVS, AIX, Dynix, VOS, DOS, OS/2	Platform-dependent	Platform-dependent	AP, AR, GL, budget maintenance, inventory control, order entry, purchasing, fixed assets, personnel, revenue accounting, sales analysis, Oracle Alert (management exception reporting)	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency, on-line Help, quickpick, flexfields, concurrent manager, user profiles	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, EIS	Audit trail, password, encryption	TCPIP, Decnet, Novell, Vines, AppleTalk, LU6.2, LU0, LU2	\$26,000-\$166,000 per module, depending on the number of modules and users
Piedmont Systems, Inc. (508) 774-4223	Piedmont Financials	VAX	VMS	150M+	4M+	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, sales analysis, complete MRP II functionality	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, multicurrency, allocations, Deformers screen technology	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password	Decnet	\$5,000 - \$190,000 purchase price; also available on monthly rental basis
Rima Systems, Inc. (415) 593-2500	Application Software	VAX	VMS, Ultrix, Unix SCO	10M per module	1M per module	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets	Cash management/check writing, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, EIS	Audit trail, password	Pathworks	\$10,000 - \$120,000 per module
Sentient Systems, Inc. (301) 929-7600	Sentient's Financial Packages	DG Avion, RS/6000, IBM 3090, ES/9000, VAX	Mumps	10M	Configuration-dependent	AP, GL, payroll	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor	No	No	No	No	GL, trial balance, journal entries	E-mail, word processor	Audit trail, password	Vaxclusters	\$30,000 starting price
Services & Software, Inc. (305) 477-4424 (800) 275-7161	Kaisen Accounting System	HP 3000, VAX, Sun 4, AT&T 3B2, Sun 4, Ariz, NCR	Unix, Xenix 386, Unix System V, Ultrix, VMS, HP-UX, SunOS	12M	1M per user	AP, AR, GL, inventory control, order entry, client invoicing, purchasing agent, sales analysis, system administration, version control	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, customizable software, vision control	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, fax	Audit trail, password, specific user access down to menu option/screen level	TCP/IP, NFS, Novell	\$4,995 for five-user system
SHA Computers, Inc. (518) 587-5886	Accounting 2000	RS/6000, NCR Tower series, Sequent Pyramid, Sun Sparcstation, HP 3000, HP 3000, HP 9000	Unix, Xenix, Ultrix, SunOS, HP-UX, AIX	100M+	1.5M per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, multicurrency, 300K capability to access reference data	Yes	Yes	Yes	Yes	GL, trial balance, revenue expense statement, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password	NFS	\$12,000 starting price, depending on module and platform
Skylight Systems (215) 576-1000 Ext. 200	Relational Financial Systems	VAX, Sun 3, Sun 4	VMS, Unix	15M per module	0.5M per user	AP, AR, GL, budget maintenance, inventory control, order entry, purchasing	Cash management/check writing, across the program data lookup or browsing, text editor	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet	Audit trail, password	Decnet, TCP/IP	\$4,500

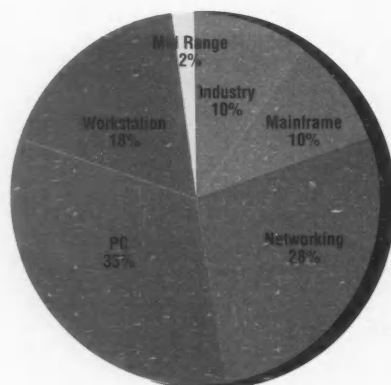
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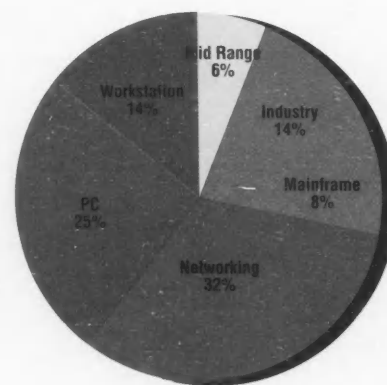
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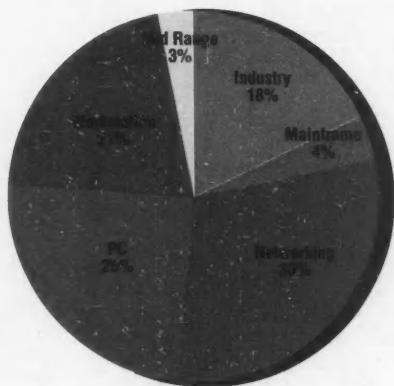
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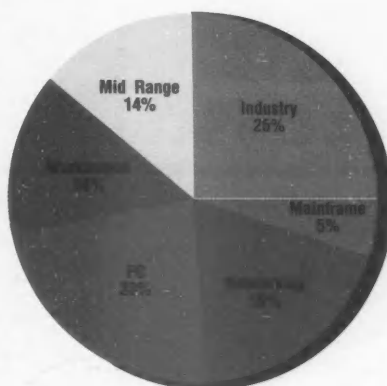
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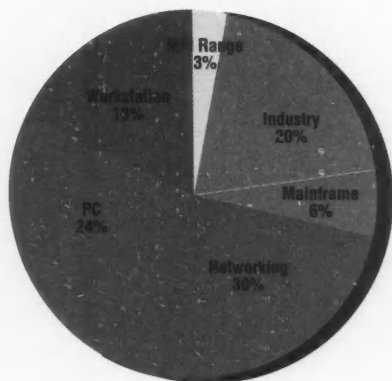
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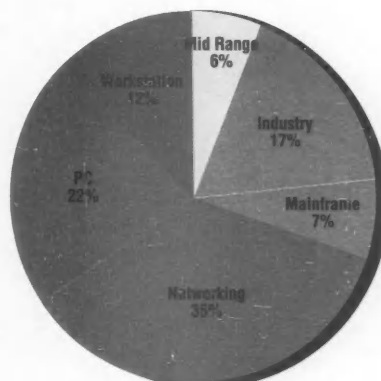
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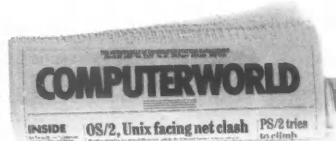
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ACCOUNTING SYSTEMS PRODUCT SPOTLIGHT

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	HARD DISK (BYTES)	MEMORY REQUIRED (BYTES)	ACCOUNTING FEATURES	ADVANCED FEATURES	CUSTOMIZABLE MENU	CASE TOOLS INCLUDED	SOURCE CODE CAPABILITIES	INTEGRATED WITH EDI	REPORTS GENERATED	OTHER APPLICATIONS PRODUCT INTERFACES WITH	SECURITY FEATURES	NETWORK SUPPORTED	PRICE
Smith Dennis and Gaylord (408) 727-1870	Visual XL/Busines XL	HP 3000, Tandem	MPE-XL, Guardian	300M	2M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, project billing	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, multicurrency, GUI	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet	Audit trail, password	Novell, 3Com	\$25,000 - \$250,000
Software 2000, Inc. (508) 778-2000	Financial Management 2000	AS/400	OS/400	250M minimum	20M minimum	AP, AR, GL, inventory control, order entry, payroll, purchasing, fixed assets	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor, EIS	Audit trail, password, encryption	None	\$150,000 - \$300,000
Software Systems Technology, Inc. (212) 964-9600	Diamond International Business Management System	IBM PCs and compatibles, AS/400, HP 3000, HP 9000, Unix	Unix, DOS, MPE-XL	20M	4M - 8M	AP, AR, GL, budget maintenance, inventory control, order entry, purchasing, fixed assets, bill of materials	Cash management/check writing, across the program data lookup or browsing, multicurrency, multilingual, multicurrency, multiple tax types	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password, encryption	Novell	\$1,500 - \$3,000 per module, depending on platform and number of users
Sotex International, Inc. (508) 372-0770	Accountable Solutions	HP 3000, HP 9000, IBM RS/6000, Wang VS, DG Avion	MPE-XL, HP-UX, AIX, SCO Unix System V Release 4, DG-UX	NA	1M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, human resources, Cobas management	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, multicurrency, integrated security, ad-hoc query	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, password, encryption	Any	\$5,000 - \$80,000
Speedware Corp. (416) 408-3880	Speedledger	HP 3000	MPE, MPE-XL	NA	24M	AP, AR, GL	Tables for state and federal income tax, cash management/check writing, multicurrency	No	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet	Audit trail, password	None	\$6,000 - \$123,500, depending on modules and platform
Spokane Computers, Inc. (509) 624-4248 (800) 824-9631	FMCS	VAX, RS/6000, Compaq	VMS, SCO Unix, AIX, MS-DOS	200M	2M per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, job shop manufacturing, work order	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password, encryption	Pathworks, Novell	Contact vendor
System Dynamics Corp. (416) 475-5155	Dynamic Solutions	IBM PCs and compatibles, HP 3000, HP 9000, RS/6000, Sun Sparcstation, VAX, DG Avion, NCR Towers, Tandem S2	Unix, VMS	150M	16M	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, executive management, contract processing	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, multicurrency	Yes	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor, EIS	Audit trail, password, encryption	All networks supported by Oracle	\$5,000 starting price per module
Systems & Computer Technology Corp. (215) 847-5930	Banner Finance System	VAX, DG, Sun, NCR AT&T, HP 3000	VMS, Ultrix, AOS/VS, SunOS, Unix, OSX, HP-UX, MPE-XL	Platform-dependent	Platform-dependent	AP, AR, GL, budget maintenance, inventory control, purchasing, fixed assets, project accounting, encumbrance accounting, grant accounting	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, multicurrency	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor	Audit trail, password	Decnet, TCP/IP, APPC/LU6.2, SPX/IPX	Contact vendor
Systems Union, Inc. (914) 948-7770	Sunsystems	VAX, HP 3000, HP 9000, NCR 3000 Series, NCR Tower series, RS/6000, Sun Sparcstation	VMS, DOS, OS/2, Unix, VMS, Ultrix, Xenix	8M	512K	AP, AR, GL, budget maintenance, inventory control, order entry, purchasing, fixed assets, project accounting, consolidation, allocations, sales-order processing	Cash management/check writing, across the program data lookup or browsing, multicurrency, multilingual	Yes	No	No	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet, word processor	Audit trail, password	Novell, Decnet, TCP/IP	\$3,000 - \$150,000, depending on number of users, modules, platform
Tasul B Computing, Inc. (313) 973-1900	Advantage	VAX	VMS	200M	1.5M per user	AP, AR, GL, budget maintenance, order entry, payroll, purchasing, project accounting, billing	Tables for state and federal income tax, multicurrency	Yes	Yes	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	Spreadsheet	Audit trail, password	Decnet, TCP/IP	\$15,000 - \$500,000 per module
Timeline, Inc. (206) 822-3140	Timeline Financial Accounting System	VAX	VMS	600M	0.75M per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, fixed assets, project accounting, job cost, time and billing, membership, fund raising	Table for state and federal income tax, cash management/check writing, across the program data lookup or browsing, calculator, text editor, multicurrency	Yes	No	Yes	No	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, EIS	Audit trail, password, record level	Decnet, Pathworks	\$18,000 - \$60,000 per module, depending on platform
Trac Line Software, Inc. (516) 348-4300	Trades	RS/6000, AS/400, DG Avion, 80386 and 1486-based machines	Unix, Xenix, AIX, OS/400	200M minimum	4M minimum	AP, AR, GL, inventory control, order entry, purchasing, retail POS	Cash management/check writing	No	No	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis	E-mail	Audit trail, password, encryption	NFS, X.25, TCP/IP, Token Ring, Ethernet	\$9,000 starting price, depending on platform and number of users
ZebraSoft, Inc. (615) 449-5901	ZebraSoft Accounting	DG Avion, VAX, Unix, HP 3000, HP 9000, RS/6000, Motorola 6000, NCR Tower series, TI S1000, S1500	DOS, Unix, AIX, DG/UX, HP-UX, MPE-XL, AOS/VS, VMS, Ultrix	5M	250K per user	AP, AR, GL, budget maintenance, inventory control, order entry, payroll, purchasing, project accounting, contract management	Tables for state and federal income tax, cash management/check writing, across the program data lookup or browsing, text editor, notes capability, windows, portability, context-sensitive Help, customizable	Yes	Yes	Yes	Yes	GL, trial balance, revenue expense statement, journal entries, accounting analysis, budget listings	E-mail, spreadsheet, word processor	Audit trail, password, menu security	Netware, Vines, TCP/IP	\$495 per module up to eight users

IN DEPTH

Zero! Zippo! Zilch!

The goal is no more software maintenance — you can get there by knowing what constitutes maintenance-free software, then creating it

BY STEVE HEARN

On the first day, the Programmer created software. On the second, He created maintenance.

Ever since the first software program was written, software maintenance has been viewed by many as a regrettable necessity. It is regrettable in that it requires talent, money and time. It is a necessity in that not doing at least bare-bones maintenance will result in a slew of unresponsive, kludgy applications. The very act of writing a program has long implied an ongoing care-and-feeding obligation that can't be ignored.

While the information systems staff may be doing a good job cutting down on the amount of maintenance it needs to do, reducing maintenance is not the key any longer. Rather, the time has come for IS to think in terms of eliminating software maintenance entirely. Maintenance-free software — software that is not modified during its entire production lifetime — should be the goal.

Rare, but it exists

Isolated cases of maintenance-free software exist today. Software that is short-lived or never executed in production (as may be the case with certain error routines) would qualify under the definition, as long as no changes were made during its production life.

Other examples might include software that performs a specific function and is well-insulated from pressure to change, such as a temperature conversion subroutine.

But these examples are narrow in scope. The true goal is software that is structured and constructed in such a way that no maintenance is necessary for its natural life, regardless of its function. The goal is one of being maintenance-free by design, not by accident.

Following are six characteristics of software designed for zero maintenance and some ideas for getting it that way. Such software does not have to have all these characteristics to be considered maintenance-free; rather, it may just have one. Keep in mind that none of these traits is easily achieved,

Hearn has been in the IS field for nearly 20 years. He is currently manager of Arco Products Co.'s data center in Los Angeles.

nor is the technology available yet to make all of them viable. Rather, these are characteristics to shoot for when designing software. They get staffers *thinking* maintenance-free, which prepares them for creating maintenance-free in the future:

ONE Maintenance-free software is clean when it goes into production.

In this case, true requirements are captured in the code so that there is no reason to "fix" the software. The software must be bug-free (or whatever bugs exist must be so minor that no modification is required).

To get to this point, the staff must emphasize requirements definition and conduct a rigorous validation of requirements and assumptions. There needs to be a quantum leap forward in testing techniques, in exploring reusable code and in employing yet-to-be-developed techniques that avoid intro-

ducing errors altogether. Software must meet performance, portability and ease-of-use requirements upon installation.

TWO Maintenance-free software is self-repairing.

The software must automatically sense and rectify any bugs that do exist and are significant enough to warrant repair.

Such capabilities exist today on a very limited scale. For example, there are software packages that intercept out-of-space conditions on disk files and allocate more space for those files, eliminating the need for intervention from programmers or operators.

However, this is just a hint of what might be possible in the future. Such detection and repair functions will require significant advances beyond current state-of-the-art technologies.

Continued on page 88

To be truly maintenance-free, software must meet the following conditions:

- Satisfy basic requirements when written.
- Accommodate change in requirements without modification to source code.
- Be immune to restless programmers and accidental change.



Christoph Ahlborn

- Try software layering, parameterization
- How to prepare your IS organization
- Users will become their own 'programmers'

Continued from page 87

THREE

Maintenance-free software is sensitive to changes in requirements and adapts itself automatically. If a lifetime's worth of requirements cannot be stipulated at the time of development, the software must both sense and adapt to changing requirements in ways that do not involve software modification. In the future, these sensing and adaptive characteristics will take their cue from how living organisms learn and adapt to changes in the environment. Artificial intelligence techniques might be useful in this regard.

However, today's software needs to employ other techniques. One such approach is parameterization, in which primary importance is placed on parameter data rather than on application data.

This parameter data defines the application data and the application's interface to users and the environment. Electronic data interchange translation software, for instance, represents software that is insulated to some degree from underlying changes in the incoming data streams. It uses embedded data about how to translate the transaction data, and in effect, the software becomes a utility whose function is to interpret parameters and direct processing accordingly.

Such software is buffered from change because alterations in the environment are reflected in changes in the parameters, not in the underlying software.

So software in a financial system, for example, could be considered maintenance-free if it were to automatically seek out a remote database of tax laws and rates that is updated as the laws and rates change.

The parameter-driven aspect of maintenance-free software implies that an enterprise's business rules are represented in a computable format to which the application refers as necessary. Differences in user preferences, such as how dates should be displayed, what currency should

Maintenance-free software won't just happen. IS managers will have to make a deliberate effort to ensure that their developers and programmers are working toward eliminating maintenance requirements in applications.

As with any evolutionary process, there is a natural pace that precludes overnight results, but organizations can nonetheless take steps to guarantee that the process proceeds at the maximum pace. The point is to prepare for the day when truly maintenance-free software is viable.

The hard reality is that it will cost you money up front to revamp your maintenance efforts, but these costs can be justified by the savings gained by not having to devote 60% to 80% of your resources to maintaining a growing base of

be used or what colors should appear on screen, must be represented in a similar fashion. Hence, changes in requirements are manifested as changes to parameters rather than code.

This sensitivity to the environment must include the ability to accommodate the addition and removal of interfacing applications and changes in data passed between interfacing applications. The eventual implementation of repository technology should be useful in accommodating changes of these types.

This is a dramatic departure from current application-centric design approaches and requires the standardization of parameter specification and meaning. But it is a shift that can dramatically limit software changes. In fact, there is a claim adjudication system used at several insurance processing firms today in which more than 95% of the changes to benefits entail no software changes whatsoever. That's

because it uses parameterization in its design.

applications. The following tips will help speed the pace of maintenance-free software development:

- Give maintainers the leeway to improve the maintainability of applications. This should include analysis of existing applications pieces that are rarely or never maintained.
- This study should entail zeroing in on those characteristics of the software that have made it so robust. Your best bet for new techniques and ideas on maintenance-free software will spring from staff members heavily involved in maintenance. Give these people freedom to explore and develop their ideas, and reward them.
- Set objectives relating to improving maintainability or avoiding it altogether for certain types of changes or a certain percent of code. This gives IS staffers a target to shoot for and emphasizes the

importance you place on reducing and eliminating maintenance.

- Fund specific efforts to avoid maintenance. Projects that develop a parameter-based infrastructure for inclusion among many applications is one area that might provide immediate payoff. Layering techniques for code that insulate it from changes elsewhere are also beneficial. Don't forget to reward end users if they come up with changes that free the IS group from maintenance chores.
- Prepare maintenance staffers for what will be shifts in their job functions as maintenance needs wane. Efforts of most staffers will be turned toward developing cleaner code and applications that require less maintenance. They'll likely be freer to learn emerging development techniques.

STEVE HEARN

FOUR If maintenance-free software is not sensitive

and adaptive to changes in its environment, then it must be well-insulated from environmental changes that would jeopardize its ability to survive intact. Software conforming to this condition would typically perform a narrow function (such as a temperature conversion subroutine) and would be well-buffered through software layering.

Layering insulates software from changes. For example, a layer devoted to graphical presentation of numerical data might be insulated from software devoted to database management system functions that supply the raw data and that may come and go as the underlying DBMS changes.

Layering, however, will require a schema (similar in concept to the Open Systems Interconnect model for communications) that will define software layers and interfaces between these layers and will assume critical importance in software architecture.

FIVE Maintenance-free software is more easily replaced

than modified. If software is tossed away and replaced by something new, the original software is not modified and is maintenance-free by definition. The throwaway code produced from certain applications generators conforms to this requirement because changes are made to the requirements input to the generator but not to the generated code. The idea of throwaway code implies that there is maintenance-free code at its root.

Note that the stipulation is not that maintenance-free software be easily replaced but only that its replacement be easier than its modification.

SIX Maintenance-free software is impervious to modification of any

type. In the extreme, the software simply cannot be changed; i.e., there is no method or tool to employ to modify the software. In a less rigorous case, the soft-

ware needs to be secure from the likes of restless programmers or accidental change. Current security and change control techniques can easily prevent production software from being altered.

Changing IS mind-set

Maintenance-free software is an appealing idea, but it will only become reality if IS changes the way it thinks about software — how it works and what it emphasizes. This rethinking must also extend to how users and IS fit into the process.

With all the changes, upkeep will increasingly fall into the hands of the masses. Parameters will be controlled by the end user, while other parameters will be controlled by central groups such as IS organizations and governmental bodies.

Firms are moving toward a day when users will have the ability to be their own "programmers" (probably via verbal commands). Users will routinely direct the underlying "core software" on how to behave, within the confines of what the software was originally designed to do.

However, there will still be a set of master programmers responsible for this core software, which will be designed to be maintenance-free and robust in accommodating changing parameters.

These master programmers will require greater levels of skill and sophistication to handle software development. The software developed to be maintenance-free will be complex and will exist in a complex environment, so software development prowess has to increase.

Developers will need to create bug-free (or bug-tolerant) code routinely, so they will look for breakthroughs in design and testing. Software architecture itself will need to be much more scientific, and the tools available to developers will need to be much more advanced. Current trends toward software stratification are promising, with object-oriented approaches, functional designs and standard interfaces bringing about the demise of monolithic programming. Indeed, these changes reflect the maturation of software development into a science.

While it may not happen for some time, maintenance as we think of it today will be viewed by future IS generations as a relic of the initial stage of software evolution. •

Even in a throw-away society, some things aren't that easy to replace...

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MANAGER'S JOURNAL

EXECUTIVE TRACK



Jerry D. Havemann has been appointed general manager of the information systems department at **Heinz U.S.A.**, a division of the H.J. Heinz Co. in Pittsburgh.

Havemann is responsible for Heinz U.S.A.'s IS strategic and tactical plans, application development, data processing and data and voice communications.

Before joining Heinz, Havemann was director of production and distribution systems at Kraft U.S.A. in Northbrook, Ill., since 1988.

Havemann holds a bachelor's degree in physics from Augustana College in Rock Island, Ill., and an MBA from the University of Iowa.



Gary L. Roberts was named vice president of IS at **Skyway Freight Systems, Inc.**, a trucking and airfreight services firm in Watsonville, Calif.

Roberts was most recently director of corporate information services at Am-dahl Corp.

A 17-year IS veteran, Roberts has also been senior systems manager for technology and operations at Amex Life Assurance Co. and senior program manager for information services at Fireman's Fund Insurance Co.

Roberts reports to Robert Baker, Skyway's chief executive officer.

David B. Kamowski has been appointed chief information officer at the **Joint Commission on Accreditation of Healthcare Organizations**, an Oakbrook Terrace, Ill.-based nonprofit organization that evaluates and accredits hospitals and other health care providers.

Kamowski was previously a senior manager at Ernst & Young specializing in information services to health care organizations. Before that, he worked for Burroughs Corp. with responsibilities for implementing Burroughs hospital information systems.

N.Y. Life moves back to the future

Insurer forsakes quest for flashy technology of 1980s, refocuses on customer service

BY NELL MARGOLIS
CW STAFF

For two decades, New York Life Insurance Co. has staked an early claim on every technology frontier. It was early into computer-aided software engineering, early into expert systems and early onto the desktop.

Now, New York Life is surging forward by rolling back from bold technology initiatives as part of a company-wide mandate to forsake flash and gimmickry and rededicate itself to customer service.

"We want to be known as the home of the professional, experienced agent: top quality, courteous and knowledgeable," says Lee Gammill, the executive vice president widely credited with spearheading the philosophical shift. Technology that serves that goal will get high priority; technology that does not will get the gate, according to John Foy, the firm's new information systems chief.

All for one, one for all

Gone is the insurance giant's traditional corporatewide "line-of-command" management structure. In its place is a cadre of interdisciplinary, cross-functional management teams that include IS representatives. The teams are charged with bringing the optimal mix of talent and perspective to one unswerving goal: ensuring New York Life customers the best products at an affordable price in record time — and at



Joyce Ravid

Stewart, Foy and Romano (from left), are part of the company's team-centric focus — and are about to spearhead several major IS projects

the end of a pleasant experience.

The newly deputized teams "will live together on projects, acting in lock step," Gammill says. "Now you'll have sitting around one table the guy who manufactures the product — in this

case, the actuary — the service people, the IS people. Together, they can tweak it, noodle it around and decide right away what's possible and what's not. We call it 'ad hococracy.'"

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Dissatisfaction No. 1 reason to find new job

BY CLINTON WILDER
CW STAFF

If dimmer job prospects during the recession have slowed the turnover in your information systems department, don't be fooled. IS employees are as ready as ever to leave, especially if they feel they have not been treated well in tough economic times.

That is the conclusion of recently published research on IS turnover by two management professors at Drexel University in Philadelphia. Magid Igbaria, professor of MIS, said organizational loyalty — never a hallmark of IS employees — is even more at risk in a recession.

"When companies go through downsizing and layoffs, employees become less loyal and less motivated," Igbaria said. "Many people are keeping their resumes on their computers and updat-

ing them every month so that when a recovery comes, they will be ready" to explore new job opportunities.

Igbaria and colleague Jeffrey Greenhaus surveyed 464 IS employees at companies that are members of the New York-based Association for Computing Machinery (ACM). Their results are published in the current issue of the ACM's monthly journal.

The researchers found that job satisfaction is by far the most important factor in retaining IS employees. On a scale of 0 to 1, job satisfaction as a determinant of intentions to leave the company achieved a score of 0.84. Promotability scored 0.20; career satisfaction, 0.15; and salary, just 0.14.

What makes IS employees dissatisfied? Getting mixed messages about their roles, being pulled off exciting projects and having to play King Solomon in conflicts between users and programmers, according to Ig-

baria. "Role ambiguity" and "role conflict" were the two greatest contributors to dissatisfaction, he said. Role ambiguities typically increase when firms are cutting back or restructuring.

The typical IS professional is "more loyal to his profession than loyal to the company," Igbaria said. "When he finishes a project, he needs to be challenged."

Igbaria warned that turnover statistics only tell part of the story. Employers' biggest problem is not the number of people who leave, but the fact that those who walk out the door tend to be the most motivated, talented and ambitious — in short, the best employees. Employers who focus on cost-cutting but ignore the human costs will pay dearly when the IS job market picks up again, Igbaria said.

"It's a telling fact that the highest paid executives in Japan are those in charge of human resources, while in the U.S., it is those in charge of finance," he said. "We know how to watch the money and maintain the machines, but we don't always maintain the people."



N.Y. Life moves back to the future

CONTINUED FROM PAGE 89

So far, it appears to be working. The first insurance offering rolled out under the aegis of the team — a whole-life product called New Traditions — was completed within six months. In the past, such efforts have taken a year or more, Vice President Julie Romano says.

The IS and Services Department's representative in the new ad hoc group, Senior Vice President Foy, has 24 years at New York Life under his belt. Foy, a seasoned executive with a compelling Irish lilt in his voice, is the new kid on the IS block, replacing recently departed IS head Thomas Pettibone [CW, Jan. 13], a former Procter & Gamble Co. IS executive known as a corporate maverick with bold ideas and charismatic execution.

New York Life executives are decisive on the point that Pettibone's exit was his own call. But an employee who requested anonymity said he shared a view that the executive's individualistic style, lauded in the late '80s, may have fallen out of favor. Pettibone, who is remaining with the company as a consultant until later this winter, declined to comment.

Team player

Foy is known as a strong manager and unswerving team player with a breadth of corporate and IS experience that's hard to find. His colleagues see him as bringing the ideal package to New York Life's new party.

The new IS director "has very good management skills," Gammill notes, "but he's also been in the trenches; that's important." Foy started his New York Life career as a programmer. From there, he went on to play the "business of the business" in a long list of business and IS capacities before taking on the senior IS post late last year.

Under Foy's leadership, New York Life looks solely on any initiative fueled solely by nifty new technology — or by the urge to root out the old (like the company's huge repository of IBM mainframe-based applications) in order to plant the firm's flag on the cutting edge.

The vision guiding the tearing down of traditional departmental walls, Gammill says, is of a firm that is "responsive, competitive and profitable, certainly — but it's also important to us to be known as the company that's easy to do business with. We've lost a lot of that."

It was lost, Gammill says, during the go-go 1980s, as corporate, financial and especially technological expansion spun out of sight.

"We came up with an IS plan that was absolutely sensation-

al," Gammill says. "It really was. We were going to go way beyond customers' expectations, way beyond their needs." What the company ended up with, he says, "was a gigantic, heavyweight thing that would take a million years to accomplish. I get tired thinking about it."

Got the message

The company got the message, in no uncertain terms, from customers themselves, Gammill says. The world "overreach" popped up in focus-group feedback. But New York Life didn't

FOY IS KNOWN as a strong manager and unswerving team player with a breadth of corporate and IS experience that's hard to find.

scuttle its outsized vision of an IS-enabled firm, Gammill says. Rather, "We dechunked it."

Notwithstanding its emphasis on team action and functional utility, New York Life's new ad hoc group is not a no-tech, or even low-tech, mandate.

On the contrary, executives point out, several major IS initiatives are in the start-up stage, with more about to spring off the drawing board.

NYLExpress, an application that allows the firm's 10,000 or so agents to do all prospecting and transmission of information to the home office on personal computers, is creating enthusiasm in the field and at headquar-

ters, Romano says. Not only does it smooth and speed sales, she says, but "It also draws newer agents into the whole business faster."

Under the authority of the strategic systems vice president, William Stewart, 25 IS employees and a team from software development contractor TRW, Inc. are at work on the first phase of a multimillion dollar, multiphase imaging project.

The current stage, which kicked off on Dec. 15, 1991, and is slated for completion in about six months, aims at imaging and archiving 100% of New York Life's new insurance applications. A second stage, Stewart says, will let underwriters go through a majority of application processing on-line; the entire process is currently done manually.

Promising experiment

On the other hand, a promising earlier experiment — the Business Analyst Program, under which IS department members were sent out to work in and report through insurance business units — is being reevaluated (see story below).

New York Life is focusing on its core business and facing up to the realization that IS, while an indispensable adjunct, isn't the whole. Such a strategic shift has sent many a firm down the outsourcing trail in recent months. Has New York Life thought about farming out IS to a professional services firm?

All the time, Foy says — but don't hold your breath waiting for a megadeal announcement with his company's name on it. "We've considered outsourcing repeatedly," he says, "but we've never found it cost-productive."

Open wide

What was brilliant in the 1980s may not be right for the 1990s — and New York Life's pioneering Business Analyst Program is a prime example.

Launched in early 1988, the program sent IS department members out to work in and report through insurance business units [CW, Sept. 12, 1988]. It is now being reevaluated — not because it was the brainchild of former IS chief Thomas Pettibone, and not even because it didn't work, but rather because its time may have come and gone, Senior Vice President John Foy says.

"The Business Analyst Program gave a few [IS members] a big window into the company's business," Foy says. Ironically, he adds, "What looked like a good idea might actually have been an impediment." Delegating specific employees to work with the "business of the business," he says, may have unintentionally left the rest of the IS crew members feeling that they were something other than participants in that core business — the very perception that New York Life's new "ad hoc" management style seeks to erase.

Now, Foy says, "We need to shift the focus to giving each individual maybe not as big a window as the Business Analyst got, but a bigger one than is open now."

NELL MARGOLIS

CALENDAR

The second annual Downsizing/Rightsizing Corporate Computing Conference and Exhibition will be held April 27 to May 1 at the Los Angeles Hilton and Towers.

Conference tracks include client/server architectures, managerial/organizational issues, user studies and networking technologies. Speakers include Theodore Klein, president of Boston Systems Group, Inc.; Andrei Chivvis, vice president and director of information systems at Financial Guaranty Insurance Co.; and Richard Kolbe, director of MIS at Harley-Davidson, Inc.

For more information or to register, contact the Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-4200.

MARCH 15-21

Development Center Institute/Spring '92 Conference. Orlando, Fla., March 15-18 — Contact: Development Center Institute, Indianapolis, Ind. (317) 846-2753.

Guide's '92 Spring Conference. Los Angeles, March 15-20 — Contact: Guide headquarters, Chicago, Ill. (312) 644-6610.

National Software Engineering And Maintenance Conference. Washington, D.C., March 16-18 — Contact: Digital Consulting, Andover, Mass. (508) 470-3870.

Global Technology and Information Management Europe. St. Louis, March 17-18 — Contact: Robert A. Rouse, Washington University Center for the Study of Data Processing, St. Louis, Mo. (314) 935-4791.

The Enterprise Networking Event '92. Washington, D.C., March 17-19 — Contact: Beth Magewick, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-2861.

MARCH 22-28

PC Windows Conference. Toronto, March 23-25 — Contact: PC Windows Canada, International Conferences and Expositions, Inc., Toronto, Canada (416) 581-8797.

Chief Networking Officer's Forum. Washington, D.C., March 23-25 — Contact: Wilma Hurwitz, Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Electronic Imaging. Anaheim, Calif., March 23-26 — Contact: Miller Freeman, Inc., Boston, Mass. (617) 232-3976.

DB/Expo '92. San Francisco, March 23-26 — Contact: Dan Wilson, Norm De Nardi Enterprises, Los Altos, Calif. (415) 941-8440.

Electronic Imaging. Anaheim, Calif., March 23-26 — Contact: Miller Freeman, Inc., Boston, Mass. (617) 232-3976.

Novell's 8th Annual Technical Development Conference. Salt Lake City, March 23-27 — Contact: Brainshare '92 Conferences & Institutes, Salt Lake City, Utah (801) 581-5809.

Open User Recommended Solutions Conference. Salt Lake City, March 25-27 — Contact: Elaine Bond, The Chase Manhattan Bank NA, New York, N.Y. (212) 676-2982.

GSI Transcomm Executive Symposium. La Quinta, Calif., March 25-28 — Contact: Sandy Parker, GSI Transcomm, Pittsburgh, Pa. (412) 963-6770.

GUI Design and Standard Setting Workshop. San Francisco, March 27 — Contact: Corporate Computing, Inc., Sausalito, Calif. (415) 332-1995.

MARCH 29-APRIL 4

The Seventh Eastern Regional Group. Clearwater, Fla., March 29-April 1 — Contact: Deidrich E. Towne Jr., Syracuse, N.Y. (315) 428-6080.

International Symposium on Parallel Processing. Beverly Hills, Calif., March 30-April 2 — Contact: Larry Canter, Computer Systems Approach, Inc., Fullerton, Calif. (714) 738-3414.

Landmark Networking Conference. New York, March 31-April 2 — Contact: Frank Tolly, Virtual Systems, Inc., Sea Girt, N.J. (908) 449-7999.

Patricia Seybold's 1992 Technology Forum. Cambridge, Mass., March 31-April 2 — Contact: Patricia Seybold's Office Computing Group, Boston, Mass. (617) 742-5200.

Landmark Networking Conference. New York, March 31-April 2 — Contact: Frank Tolly, Virtual Systems, Inc., Sea Girt, N.J. (908) 449-7999.

International Conference on Multichip Modules. Denver, April 1-3 — Contact: International Society for Hybrid Microelectronics, Reston, Va. (703) 471-0066.

APRIL 5-11

Servicetrends Executive Ninth Annual Conference. Boston, April 5-7 — Contact: Datasquid/Ledgewood, Framingham, Mass. (508) 370-6262.

The Information User Association. Dallas, April 5-9 — Contact: Greg Dummer, IUA, Chicago, Ill. (312) 644-6610.

Virtual Reality East '92. New York, April 6-8 — Contact: Marilyn Reed, Meckler Conference Management, Westport, Conn. (203) 226-6967.

Defense System Software Seminar. Boston, April 7-9 — Contact: David Maibor Associates, Inc., Needham Heights, Mass. (617) 449-6554.

Supercomputer Conference. Newport, R.I., April 7-9 — Contact: John Miguel, Federal Information Processing Council, Middletown, R.I. (401) 841-4591.

APRIL 12-18

The Borland International Developers Conference. Monterey, Calif., April 12-15 — Contact: Borland International Developers Conference, CT Meeting Planners, Inc., Monroe, Conn. (203) 261-6227.

United States Society of Wang Users (USSWU). Washington, D.C., April 14 — Contact: USSWU Office, Chicago, Ill. (708) 652-3888.

CIME/Design. Detroit, April 14-16 — Contact: Joe Baxter, CIME/Design, Chadds Ford, Pa. (215) 444-9690.

Auditing Information System Computer Contracts. Detroit, April 15 — Contact: Spud Watkins, EDP Auditors Association, Inc., Troy, Mich. (313) 769-8300.

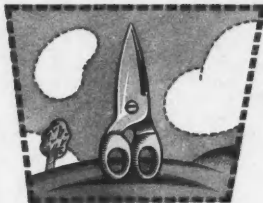
APRIL 19-25

Network Analysis Users Group Conference (NAUG). Monterey, Calif., April 20-24 — Contact: Sandy Moretto, NAUG headquarters, Menlo Park, Calif. (415) 688-2836.

Netcom West '92. Anaheim, Calif., April 21-23 — Contact: Jim Kloiber, Information Development Corp., Silver Spring, Md. (301) 565-4233.

Supercomputing Japan '92. Yokohama, Japan, April 22-24 — Contact: Meridian Pacific Group, Inc., Mill Valley, Calif. (415) 381-2255.

CLIPS



Tim Lewis

Items of interest from publications, speeches, surveys and research projects

"The Power of Integrated Information"

By Kathy Barton, GE Information Services

Speech on sales force automation presented at Gartner Group, Inc.'s Inter-Enterprise System Conference

■ The definition of sales force automation is no longer "just territory account management on a laptop," Barton said, "but an integrated set of systems and tools that transcend local capability . . .

"There is information in the sales rep's head that headquarters would like to know. Everybody from his manager to the marketing [staff] to the vice president would like to know on whom he's calling, what the market looks like, what the competitors are doing and what his clients are telling him about his product. This can be translated into call reporting, sales forecasting, client information profiles, expense reporting, electronic mail and order entry. What the sales rep gets in return is company and competitive information that permits [him] to go into sales calls more prepared . . .

"I differ a little from some people who support sales force automation. I don't think it necessarily gets you more calls per day [though it might]; I think it gets you better calls per day."

"Executive Information Systems Development Practices"

By Hugh Watson, Richard Watson and Sanjay Singh at the Terry College of Business at the University of Georgia and David Holmes at Knowledgeware, Inc.

Field Survey

■ Results of this survey of 43 organizations indicate that conventional wisdom about executive information systems (EIS) does not always jibe with reality. The researchers found, for example, that although interest in EISs is often attributed to their usefulness in obtaining external information and monitoring changes in the external environment, companies they surveyed were much more interested in the internal improvements that EISs could effect.

The three primary motivators for developing an EIS, according to respondents, were to "provide easier, faster access to information, improve the efficiency and effectiveness of senior executives and monitor organizational performance."

In addition, fewer respondents than

expected (slightly over 50%) indicated that their EISs incorporated integrated decision support and electronic mail — both of which are often mentioned in articles on the subject — as key features. Much more common among the companies surveyed were drill-down features and color screens, which were present in almost all systems.

"Continuous Improvements to Meet Customer Expectations"

By Frank Greenwood

Journal of Systems Management
February 1992

■ As customer expectations increase, so does the need to emphasize continuous

process improvements. Firms can identify changing needs and expectations by listening to the "voice of the customer" as heard through surveys, market research, focus groups and other vehicles and by asking key questions such as, "How do your errors affect them?"

Processes must be developed that will help the company calibrate its operations to this customer "voice" through specific measurements of process output.

"Process Progress"

By William T. Wilde

Inform
February 1992

■ Wilde, a vice president at Wang Lab-

oratories, Inc., said that some of the most important success factors in a business process re-engineering effort are intangibles such as leadership, attitude and co-operation. Combining these factors with clearly defined goals and a basic, well-thought-out plan can improve any business' operations.

Wilde advocates a five-phase plan that starts with a detailed evaluation of what you really want to accomplish and includes postimplementation modifications.

He described how, using this plan, ITT-Hartford Insurance Group developed a distributed claim automation system to improve claims handling in its 75 offices nationwide and won over initially skeptical employees.

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1992 Computerworld Editorial Calendar (January-June)

Issue Date	Ad Closings Color* B/W	Editorial Feature	Show Distribution	Ad Readership Issue	Response Card Decks
Jan. 6	Dec. 20 Dec. 27	Executive Report: The Information Systems Contribution to Quality			
Jan. 13	Dec. 27 Jan. 3	Product Spotlight: Windows Applications			Mails: Jan. 15 Space Close: Dec. 5 Mat'l Close: Dec. 5
Jan. 20	Jan. 3 Jan. 10	Executive Report: Customer Service Industry Closeup: Automotive Industry			
Jan. 27	Jan. 10 Jan. 17	Product Spotlight/Buyers' Scorecard: LAN Management	Communication Networks Jan. 28-30 Washington, D.C. Windows OS/2 Jan. 28-30, San Jose, CA	Harvey Study	
Feb. 3	Jan. 17 Jan. 24	Executive Report: Using IS for Fast Track Product Development			
Feb. 10	Jan. 24 Jan. 31	Product Spotlight: E-Mail	Networld Feb. 11-13, Boston	Starch Study	Mails: Feb. 12 Space Close: Jan. 3 Mat'l Close: Jan. 6
Feb. 17	Jan. 31 Feb. 7	Executive Report: Beyond Sales Force Automation			
Feb. 24	Feb. 7 Feb. 14	Product Spotlight/Buyers' Scorecard: Accounting Systems			
Mar. 2	Feb. 14 Feb. 21	Executive Report: Information Systems at the Point of Customer Contact			
Mar. 9	Feb. 21 Feb. 28	Product Spotlight/Buyer's Scorecard: Client/Server Application Development		Starch Study	Mails: Mar. 11 Space Close: Jan. 31 Mat'l Close: Feb. 3
Mar. 16	Feb. 28 Mar. 6	Integration Strategies: Pulling Macs Into the Enterprise Network Industry Closeup: Aerospace			
Mar. 23	Mar. 6 Mar. 13	Product Spotlight/Buyers' Scorecard: RISC Desktop Machines and Servers	DB Expo Mar. 23-26 San Francisco	Starch Study	
Mar. 30	Mar. 13 Mar. 20	Executive Report: Can IS be Held Liable? Liability for the Loss or Misuse of Sensitive Information			
Apr. 6	Mar. 20 Mar. 27	Product Spotlight/Buyers' Scorecard: PC Software—Fresh Application Categories and New Twists on Old Ones Special Supplement: Innovative Windows Application	Comdex Spring '92 and Windows World Apr. 6-9, Chicago		
Apr. 13	Mar. 27 Apr. 3	Executive Report: Doing Business Abroad			Mails: Apr. 15 Space Close: Apr. 3 Mat'l Close: Apr. 6
Apr. 20	Apr. 3 Apr. 10	Product Spotlight/Buyer's Scorecard: Printers Best Suited for a LAN Environment			
Apr. 27	Apr. 10 Apr. 17	Executive Report: To Be Announced		Starch Study	
May 4	Apr. 17 Apr. 24	Product Spotlight/Buyer's Scorecard: Midrange Systems That Run Enterprises			
May 11	Apr. 24 May 1	Integration Strategies: Creating an "Open" Company Industry Closeup: Personal Care Industry		Starch Study	Mails: May 13 Space Close: Apr. 3 Mat'l Close: Apr. 6
May 18	May 1 May 8	Product Spotlight/Buyers' Scorecard: Routers	Interop East May 18-22 Washington, D.C.		
May 25	May 8 May 15	Executive Report: To Be Announced			
June 1	May 15 May 22	Product Spotlight: What the Well-Equipped Help Desk is Using			
June 8	May 22 May 29	Product Spotlight/Buyer's Scorecard: MRP II			Mails: June 10 Space Close: May 1 Mat'l Close: May 4
June 15	May 29 June 5	Executive Report: To Be Announced			
June 22	June 5 June 12	SPECIAL SUPPLEMENT: Computerworld's 25th Anniversary Product Spotlight/Buyers' Scorecard: Portable Computing (laptops, notebooks, pen-based and wireless technologies)	PC Expo June 23-25 New York City AIIM June 22-25 Anaheim	Starch Study	
June 29	June 12 June 19	Executive Report: To Be Announced			

* Includes ads placed within Executive Report or Product Spotlight sections and premium positions.

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Your entry should be a custom program currently in use (not a prototype), and not for resale. It should also be either an entirely new application, a modification of an off-the-shelf application, or a Windows front-end for a host application.

And of course, it should require Windows.

Entries will be accepted in the following seven industry categories:

- 1) Manufacturing, 2) Finance/Insurance/Real Estate, 3) Transportation/Communications/Utilities, 4) Services/Professions, 5) Wholesale/Retail/Distribution, 6) Government/Public Administration, and 7) Other.

Call for Entry.

To enter, call the "Windows Open" Hotline at 1-800-829-4143, or 1-206-284-4143 for an official "Windows Open" entry kit.* But hurry. The entry deadline is Mid-night, February 28th, 1992.

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COMPUTER CAREERS

Training always a viable niche in high tech

BY ALICE BREDIN
SPECIAL TO CW

While information systems training may be hit hard when budgets are cut, trainers, recruiters and other insiders say it still offers some good career opportunities.

Best bets, according to experts: small companies, service firms, banks and insurance companies. The latter can be especially promising, says Elliott Masie, president of the Association for Computer Training & Support, a Raquette Lake, N.Y.-based association for training professionals.

In many cases, Masie says, downsizing and re-engineering have placed more technical burdens on claims processing personnel. "The company wants one person to take information and have a check pop out of a computer. That person may be using seven systems and will need training," he says.

One hopeful sign is that training is becoming more of an ongoing process; good IS trainers can often outlast a specific project. A trainer who might have taught a class on Lotus Development Corp.'s 1-2-3 a few years ago, for example, now might offer a wid-

er, more permanent range of training and support.

A good example is Farm Bureau Insurance, Inc. in Indianapolis. Business support analyst Jack Kissner now answers ongoing questions about mainframes and personal computers along with doing his IS training.

• **Service firms** can be a good bet for experienced or would-be IS trainers. Eager to stay competitive, many companies are holding steady or increasing training.

For instance, Kaiser Foundation Health Plan, Inc., a health maintenance organization in Walnut Creek, Calif., has expanded training this year, says Sharon Williams, supervisor of IS staff development and training.

The increase is partly because of new company guidelines mandating that each employee receive 40 or more hours of training each year, including computer training, she explains.

Many of the programs focus on new PC applications such as computer-aided software engineering, local-area networks and multiple platforms.

• **Regulated industries** are another good bet. That's because utilities are required by law to train workers.

"Utilities spend a lot of money on training programs and equip-

ment because there is a safety issue involved," says Bill Brandon, manager of employee development at Atmos Energy Corp. in Mesquite, Texas.

• **Technology-heavy companies** that use lots of computers and software are a seemingly obvious but often overlooked gold mine for IS trainers.

At White Plains, N.Y.-based Kraft General Foods, Inc., for example, data needs change every

week or month. "Systems are constantly evolving," says Kathy Porter, systems specialist at Kraft, "and therefore, [training] will never be finished."

• **Small companies, especially software vendors**, are worth looking at. Large firms traditionally have offered the best training opportunities. But some experts now say trainers should look to small firms for jobs — and appreciation. Trainers at

small companies might also be asked to assume some sales responsibilities.

Look for a small software development firm with two to three products, suggests Sandy Danna, recruiting manager at Technical Directions, Inc., a recruiting company in San Diego.

• **Self-employment** is another option that deserves consideration. Training consultants often get higher fees than staff trainers, enjoy greater respect and often get more interesting work, notes David M. Blocker, president of David M. Blocker and Associates, Inc. in Sharon, Mass. "On the other hand, if things don't go well for some reason, you tend to get really dumped on."

Other minuses: Many consultants fail within 12 months, according to Masie. Also, independents must often compete with huge firms that can offer cheaper rates. Finally, an independent consultant must also be a savvy marketer. "Just because you are a good trainer doesn't mean you can sell and run a business," he says.

If you're lucky enough to find a good potential job, experts say, the next step is to look a bit more closely. For starters, take a careful look at the manager's attitude toward training and any existing plans for accomplishing projects.

Experts also say it's a good sign if the company has kept the position open for a while as it searches for "the right person."

Working conditions for IS trainers

Are you an IS professional thinking about becoming a trainer? Following is a guide to what you can expect:

► **Compensation:** Salaries average from the low \$20s to the high \$50s, depending on the firm and your experience. A specialty or knowledge of certain technology can mean more money.

► **Travel:** Many training jobs involve travel, though some cost-conscious companies are limiting the amount required. Jobs with commercial training firms always involve heavy travel.

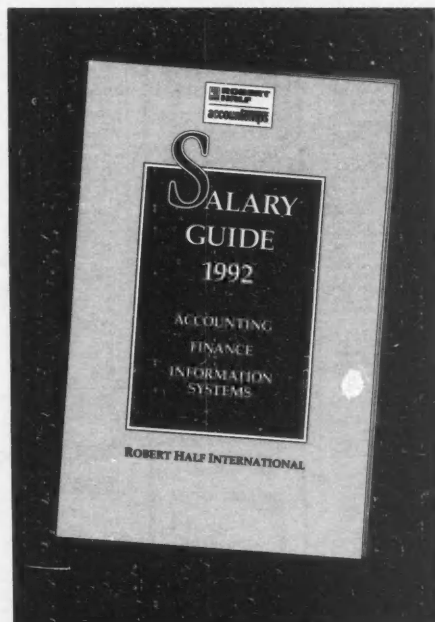
► **Hours:** With luck, training can be a 40-hour a week job. But your hours may increase if your job includes support, consulting or other functions.

► **Location:** Most training takes place in the classroom. But less traditional forms are becoming more popular, including computer-based training, one-on-one sessions and conference-room sessions.

► **Advancement:** Opportunity for advancement can be limited because each training department usually has only one manager. But trainers and industry experts say great potential exists for trainers to move into other departments. Trainers' organizational, selling and presentation skills can open many doors.

ALICE BREDIN

Bredin is a free-lance writer based in New York.



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Fresh start requires academic degree

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Chick Bisberg, president of Two-Party Systems, Inc., an information technology recruitment firm in Livingston, N.J.

Q I am a victim of a recent downsizing at a computer hardware manufacturer. During the past few years, I've become interested in robotics and artificial intelligence. I have no work background in the field but am considering opportunities there. I have 25 years of experience in hardware and software development and headed manufacturing quality control.

With a resume like mine, have I got a chance?

A Yes — if you're prepared to start in an academic program that will provide both the theoretical and practical training you'll need to be competitive for entry-level technical positions.

Q I am a computer operator at an outsourcing and systems integration firm. Do you think getting a bachelor's degree in computer science would increase my chances of securing an entry-level programming position? Or is practical experience at this level more important?

S.S.

Garland, Texas

A Your efforts will probably be most successful if you pursue the bachelor's degree option.

Coupled with continued employment in your firm, the degree will make your resume more competitive and provide a better springboard for future academic or professional options.

FAST TRACK CAREER ADVICE FOR THE '90s

Q I am a programmer/analyst with two years' experience, and I hold a bachelor's degree in computer science, with a minor in business administration.

I am not sure whether to complete my master's degree in information systems or pursue an MBA with an IS concentration. Which would be more profitable for someone who wants to remain technical?

L.M.

Chicago, Ill.

A You should be able to continue on a technical track without an advanced degree. If, however, the more esoteric technical disciplines, such as robotics, parallel processing or other advanced technology areas, are only open to you through the graduate degree route, then go after the IS degree.

If your IS career runs along a less esoteric path, it will require business analysis skills. Clearly, a good MBA program will help

you develop those abilities.

Q I am a senior programmer in a large bank and have received dozens of phone calls over the past two years from headhunters. I have always brushed them off. Now my bank is merging with another one, and I'm concerned that my job may be in jeopardy. I want to find a headhunter to assist me but am turned off by the ones I've heard from. How do I find a good one?

A It's a safe bet that you aren't alone in your worries; several of your colleagues probably have found past or present positions through recruiters. Some could suggest a good one.

There are several things you should look at in evaluating recruiters: How established are they? Have you heard of them or their firm? Have they requested an in-person interview? Most reputable recruiters will want to meet you as part of their screening process. Do they have a solid understanding of your "target market"?

Look for headhunters who care enough to lay the groundwork for a long-term relationship.

We welcome your questions. Send them to Kelly Dwyer, Careers Fast Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Your initials and town will be printed unless you request otherwise.

TIP of the MONTH

What's the best way to research a potential employer?



Today, it's more critical than ever to keep in touch with former employers. Most people spend hours researching a firm and then run into a friend who works there or knows someone there who can give them the inside line.

**Richard Wonder, national director
Information Systems Division
Robert Half International, Inc., New York**

Learn the company's bottom-line business goals by getting an annual report from the company or from a stock broker. You can also get information using libraries' business directories and on-line search services, such as Lexis or Nexis.

**John Mengelt, managing director
Breckenridge Partners, Northbrook, Ill.**

Put the word out to your friends and colleagues. Invariably, there will be someone who knows someone, and they will probably be willing to speak with you — but you need an introduction. Read the business and trade press to track the companies you're interested in.

**Beverly Lieberman, president
Halbrecht Lieberman & Associates, Inc., Stamford, Conn.**

Don't miss the obvious — like calling the company directly and asking for information from public relations or investor relations. You'd be surprised what information you can get, especially if the company is large.

**Steven Fogle, partner
Alexander Group, San Francisco**

A recruiting firm can tell you what a company looks for, what it values, the employee makeup, what aspect of IS they look for and whether they want broader or narrower skill sets.

**Robert Klevin, president
Robert Klevin and Co.
Lexington, Mass.**

Kathleen Gow is a free-lance writer based in Medford, Mass.



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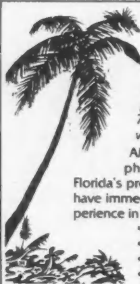
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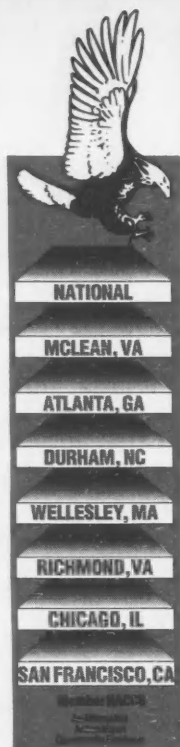
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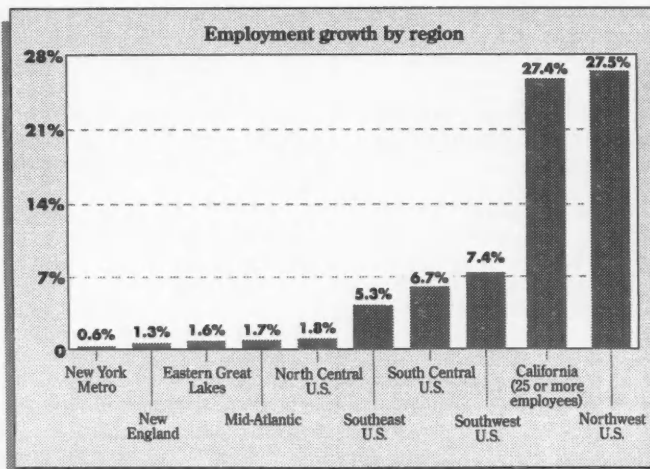
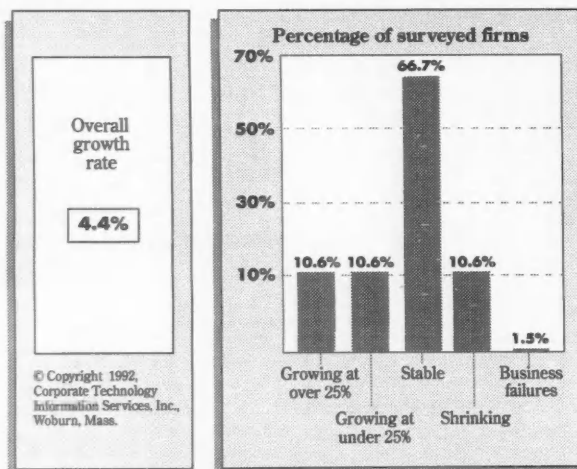
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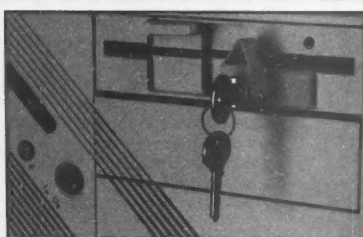
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MARKETPLACE

Copyright won't work? Call it a trade secret

Legal eye is a column exploring legal issues and their impact on information systems.

BY JERRY W. MILLS
SPECIAL TO CW

Although the U.S. Supreme Court recently stripped away a significant layer of protection for corporate databases with its ruling that data compilations are not copyrightable, information systems managers still have one alternative: They can insulate proprietary on-line information using trade-secret law.

Trade-secret protection can be applied to information that is secret, substantial and valuable, including computer programs and database compilations of formulas, product ideas, corporate operations, client profiles and marketing information.

Designed to keep internal company information secret, trade secrets do not require a formal application process. Rather, protection arises by designating the information as secret and taking preventative measures to keep it protected.

Depending on the state, theft of a trade secret can be a criminal offense, such as when it is proven that a former employee carried unauthorized information with him to his next job. More common, however, is that companies just want the courts to prevent the information from being further used by unwanted parties.

Trade-secret advantages

Protecting information via a trade secret has certain advantages over other modes of protection, such as patents. Patent protection is available only for certain types of innovations, such as machines or chemical compounds, but it does not include math formulas, ideas, methods of doing business and many other types of corporate information. Patent protection is also limited to 17 years, whereas a trade secret can be protected forever.

Likewise, copyright laws protect expressions of ideas, prohibiting only the copying of those expressions. Anyone is free to use the information in copyrighted works, as long as it's not copied.

There are a couple of important caveats to trade-secret protection, however.

Trade-secret law does not routinely protect information shared on-line between trading partners. Because the information is regularly accessed by outside sources, it is considered to be in the public domain unless all parties sign nondisclosure agreements.

Trade-secret law is also limited because it only allows companies to collect damages if they can convince the courts that the information was marked as confidential and that an ex-employee or other party illegally obtained and used it.

If a company spent significant efforts to develop a list of potential customers to whom they intended to market their product but allowed employees unrestricted access to it, they would have no recourse if an employee used it after leaving the company or passed it along to someone else. But if steps were taken to make the list less accessible, use of the information by any unauthorized person could be actionable.

The first step in implementing an effective trade-secret protection program is to designate an individual in the organization to coordinate and control the program. This individual — working

closely with other departments — will set up procedures to ensure proper handling of valuable information.

Next, identify the information, on-line or other, to be protected. Once identified, the information should be classified and labeled according to the level of secrecy required. Labels should appear on all valuable documents and even on the computer screens of users who have access to databases or other sensitive, on-line information.

These labels indicate that a well-thought-out program is in place, making it easier to prove in court that the information was wrongfully taken.

Common levels of secrets include the following:

• **Critical** — Disclosure would be devastating to the company.

• **Top secret** — Disclosure would be damaging but not catastrophic.

• **Secret** — Should be considered a trade secret, but disclosure would not be very damaging.

• **Confidential** — Secrecy is preferred.

However, it is important not to overdo it. Marking everything as "secret" may be construed by the courts as lack of guidelines for employees using the data. In

this case, protection may be lost.

To help prove a trade-secret theft in court, measures other than labeling can be taken. Employers can do the following:

• Limit access to corporate databases to a "need-to-know-basis."

• Frequently change passwords to important databases.

• Implement a badge system for areas where sensitive information is produced and kept.

• Number the copies of secret documents and log their locations to help prove access was limited.

Visitors and subcontractors should also be told that secrets they become aware of during their stay are not to be disclosed. A signed nondisclosure agreement works well in this instance, but again, it should be used judiciously.

Not surprisingly, most trade-secret problems arise when employees leave, taking secrets with them, or when new employees are hired, bringing secrets from other companies.

This is the time when confidentiality issues need to be introduced and employees familiarized with protection programs, making it difficult for them to claim they were unaware of the secrecy of certain kinds of information.

Mills is chairman of Baker & Botts' Intellectual Property Group and heads the firm's Technology Group.



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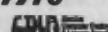
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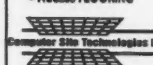
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AT Model 099	\$400	\$525	\$300
AT Model 239	\$550	\$650	\$250
AT Model 339	\$700	\$1,000	\$700
PS/2 Model 30 286	\$750	\$900	\$700
PS/2 Model 60	\$700	\$900	\$600
PS/2 Model 80	\$2,050	\$2,100	\$2,000
PS/2 Model 90	\$4,300	\$4,600	\$4,100
Compaq Portable II	\$450	\$500	\$375
Portable 286	\$900	\$1,000	\$800
Portable 386	\$2,000	\$2,125	\$1,600
SLT 286	\$700	\$900	\$600
LTE 286	\$950	\$1,300	\$900
Deskpro 286E	\$650	\$1,000	\$600
Deskpro 386/20	\$2,000	\$2,200	\$1,900
Apple Macintosh Plus	\$700	\$750	\$650
SE	\$950	\$1,050	\$950
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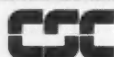
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ITALY: Umberto Costantini, Computer Publishing Group, Via Vito 7, 20127 Milano, Italy, Phone: (011) 39 2 261342, Telex: (843) 33518, Fax: (011) 39 2 284 0737

JAPAN: Jim Ryec, IDG Communications/Japan, Kocho TBE Bldg., 5-2 Kojima, Chiyoda-ku Tokyo 102, Japan, Tel: (011) 81 3 226 6411, Telex: (781) 252 4217, Fax: (011) 81 3 222 6566

MEXICO: Henry Morales, Computeworld Mexico S.A. de C.V., Avenida 21-2, Mexico City 7 D.F. Colonia Roma, Mexico, Tel: (011) 52 5 14 4218 or 5205, Telex: (387) 177 1300 (ACHAME) MX, Fax: (011) 52 5 11 4862

THE NETHERLANDS: Rudi Bakker, IDG Communications B.V., de Heuslaan Postbus 18, 1071 JA Amsterdam, The Netherlands, Tel: (011) 31 20 664 6420/664 5418, Telex: (844) 18242 COMW NL, Fax: (011) 31 20 758 0100

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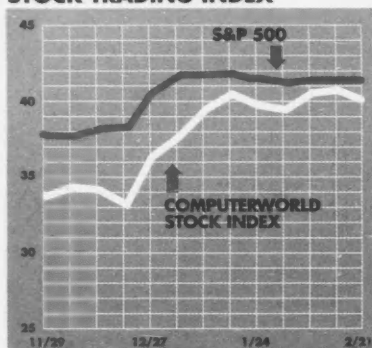
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STOCK TRADING INDEX



INDUSTRY ALMANAC

ANALYSIS IN BRIEF

Software and services

Louis Giglio, Bear, Stearns & Co., Feb. 7.

The outlook for earnings and sales growth at **Borland International, Inc. (BORI)** for the next 12 to 18 months is bright because the company will likely introduce new versions of all its major products for MS-DOS and Windows from **Microsoft Corp. (MSFT)**. Buy Borland.

For Microsoft, there will be no sales driver until Windows 3.1 ships, probably in April, so the company is rated a hold for now. **Software Publishing Corp. (SPCO)** is also a hold.

Telecommunications

Kenneth Leon, Thomas Calcagnini,

Bear, Stearns, Feb. 7.

AT&T (ATT) is taking more active roles in the cellular and personal communications services arenas. Demand for this equipment will be mixed. The key is getting the industry to agree to support standards and interoperability.

AT&T is rated a strong buy, while **MCI Communications Corp. (MCIC)** is a buy and **United Telecom (UT)**, the parent company of U.S. Sprint Communications Co., is a hold.

Object-oriented 4GLs

Paul Bloom, Volpe, Welty & Co., Feb. 3.

Object technology is a natural software medium to express the attributes and relationships among real world business entities. Several object-based, fourth-generation languages appear to be gaining in popularity, including Windows/4GL from **The Ask Cos. (ASK)**, Powerbuilder from **Powersoft, Inc.** and Progress Version 7.0 from **Progress Software, Inc. (PRGS)**. More robust object-oriented tools should also come to fruition. **IntelliCorp, Inc. (INAI)** looks good on that front.

RECOMMENDATION CHANGES

UPGRADED FROM HOLD TO BUY: Apple Computer, Inc. (Mabon Securities Corp.). Strong product momentum on Powerbook notebook computer line and declining operating expenses make Apple (AAPL) a buy right now.

KIM S. NASH

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, FEBRUARY 21, 1992

TOP PERCENT GAINERS

Wang Labs Inc. (W)	27.50
Intelligent Info. Systems (H)	25.44
Gandall Technologies Inc.	22.22
Hewlett-Packard Co. (H)	18.66
Computer Automation Inc.	14.29
Group Software	12.82
General Datacomm Inds. (H)	12.50
Maxtor Corp. *	11.86

TOP DOLLAR GAINERS

Hewlett-Packard Co. (H)	11.88
Intelligent Info. Systems (H)	5.38
Picturatel Corp.	3.75
Digital Equipment Corp. *	2.63
Group Software	2.50
Stratus Computer Inc. (H)	2.13
Rastrop	2.13
Exabyte	1.75

TOP PERCENT LOSERS

Zeos International Ltd.	-17.54
Gateway Communications	-15.17
Cray Computer	-11.76
Network Systems Corp.	-11.54
Camdex Corp. (H)	-11.11
Information Resources (H)	-10.56
Printronic Inc.	-10.53
Struct. Dynamics Research	-10.42

TOP DOLLAR LOSERS

Microsoft Corp. *	-4.00
Zeos International Ltd.	-3.75
Bachman Info. Systems (H)	-3.75
Information Resources (H)	-3.75
Parametric Technology	-2.75
Cisco Systems Inc. (H)	-2.75
Octel Communications Corp. (H)	-2.63
Southwestern Bell Corp.	-2.63

Exch 52-Week Range Feb. 21 Wk Net Wk Pct

Communications and Network Services Dfl 1.18%

OTC 15.00 6.75	3 COM Corp. (H)	13.63	-0.88	-6.03
NYS 69.00 55.75	American Info. Techs. Corp.	61.25	-1.00	-1.61
NYS 41.38 32.50	AT&T *	37.63	-1.00	-2.59
NYS 4.25 1.25	Arista Communication Corp.	3.38	-0.13	-3.52
NYS 52.75 43.00	Bell Atlantic Corp.	43.38	-1.25	-2.80
NYS 54.13 45.38	BellSouth Corp.	46.00	-2.38	-4.91
NYS 9.38 4.75	Bell, Beranek & Newman	5.75	0.13	2.22
OTC 18.25 8.75	Bellcore	17.50	-0.63	-3.57
NYS 65.88 30.25	Cabletron Systems (H)	83.00	-1.63	-2.51
OTC 31.00 11.75	Chippicom Corp.	27.50	-0.25	-0.90
OTC 87.25 21.00	Cisco Systems Inc. (H)	81.75	1.25	1.50
OTC 35.25 13.75	Compression Labs Inc.	24.75	-0.63	-2.46
OTC 5.13 1.50	Data Switch Corp.	2.75	0.25	10.00
OTC 23.83 12.38	Digital Comm. Assoc. *	22.38	0.50	2.23
OTC 21.50 8.50	Digital Systems Int'l Inc.	14.38	0.13	0.88
OTC 9.75 3.63	DSC Communications	5.56	-0.31	-5.31
OTC 12.38 5.00	Florida Int'l Inc.	8.75	0.25	2.94
OTC 29.75 11.00	Filenet Corp.	29.00	0.50	1.75
OTC 3.75 1.13	Gandall Technologies Inc.	2.75	0.50	22.22
OTC 2.69 1.00	Gateway Communications	1.75	-0.13	-7.17
NYS 4.80 2.13	General Datacomm Inds. (H)	4.50	-0.50	-12.50
ASE 5.88 0.50	Go Video (H)	4.25	-0.13	-2.86
NYS 35.00 28.13	GTE Corp.	30.25	-0.63	-2.04
NYS 63.00 50.00	ITT Corp.	61.38	1.63	2.72
OTC 35.00 24.63	MCI Communications Corp.	34.13	0.50	1.49
OTC 14.50 5.00	Microcom Inc.	13.25	-0.25	-1.92
NYS 18.25 5.88	Network Equipment Tech. *	17.50	-0.63	-3.57
OTC 28.50 6.75	Network General	23.00	-1.25	-5.15
OTC 20.00 10.50	Network Systems Corp.	14.38	-1.88	-13.14
OTC 14.25 4.13	Newbridge Networks Corp. (H)	13.13	-0.88	-6.70
NYS 49.25 28.63	Northern Telecom Ltd. (H)	48.00	-0.75	-1.54
OTC 65.00 22.63	Novell Inc.	61.25	1.38	2.30
OTC 68.00 28.13	Nynex Corp.	72.63	1.13	1.57
OTC 36.50 16.50	Octel Communications Corp. (H)	33.63	-2.63	-7.24
OTC 11.63 5.63	Perini Data Comm. Ntwks.	8.50	-0.38	-4.23
OTC 51.50 18.75	Picturatel Corp.	18.88	4.88	25.85
OTC 18.75 9.75	Proteon Inc. (H)	17.00	-0.50	-2.86
NYS 19.75 11.63	Scientific Atlanta Inc. (H)	17.38	-0.75	-4.14
NYS 66.00 49.00	Southwestern Bell Corp.	57.50	-2.63	-4.57
OTC 51.00 14.25	Synoptics Communications	24.00	-0.75	-3.03
NYS 31.50 21.25	United Telecom	21.63	-0.75	-3.35
OTC 40.13 33.75	US West Inc.	37.13	-1.00	-2.85
OTC 41.25 21.00	Wellfleet Communications	37.50	-1.50	-3.85

PC/Workstations

OTC 20.75 6.75	Advanced Logic Research	8.25	0.25	3.13
OTC 3.63 1.50	Alpha Microsystems	0.00	0.00	0.00
OTC 73.23 40.25	Apple Computer Inc. *	65.00	0.88	1.36
OTC 32.75 14.50	AST Research Inc.	27.50	-0.75	-2.73
OTC 21.63 10.13	Commodore Int'l	14.00	-0.88	-6.28
NYS 74.13 22.13	Compaq Computer Corp. *	30.25	-1.25	-3.97
OTC 36.25 20.25	Cray Computer Corp.	32.75	-3.38	-11.60
OTC 7.00 2.88	Everex Systems Inc.	6.25	-0.25	-4.17
NYS 30.75 21.25	Harris Corp.	30.25	0.75	2.54
NYS 75.50 44.50	Hewlett-Packard Co. (H)	73.13	1.88	2.58
OTC 20.88 7.88	Mips Computer Systems	10.88	-2.25	-20.75
NYS 56.50 26.50	Silicon Graphics (H)	55.75	0.25	0.45
OTC 38.63 20.75	Sun Microsystems Inc. *	33.00	0.63	1.93
NYS 35.50 23.38	Tandy Corp.	31.00	1.00	3.33
NYS 11.13 5.13	Zenith Electronics (H)	9.88	-0.25	-2.47
OTC 25.50 11.63	Zeos International Ltd.	17.63	-3.75	-21.54

Large Systems

ASE 19.88 11.63	Andohi Corp. *	18.88	-0.13	-0.66
OTC 2.63 0.88	Computer Automation Inc.	0.00	0.13	14.29
NYS 13.38 7.50	Control Data Corp.	11.75	0.25	2.17
NYS 19.75 8.88	Convex Computer	14.50	-0.63	-4.13
OTC 19.63 1.13	Adius Corp.	5.63	-0.75	-13.78
NYS 52.25 31.50	Cray Research Inc. *	42.25	-2.63	-6.25
NYS 22.50 8.50	Data General Corp.	12.13	1.00	8.59
NYS 83.00 48.50	Digital Equipment Corp. *	62.25	2.63	4.40
NYS 135.13 83.50	IBM *	89.88	1.13	1.24
NYS 140.00 104.00	Matsushita Electronics (L)	106.13	-2.13	-1.96
OTC 29.50 10.75	Pyramid Technology	16.00	0.00	0.00
OTC 19.75 7.50	Sequent Computer Sys.	17.25	-0.38	-2.13
OTC 18.38 8.63	Sequax Systems Inc.	13.63	-1.00	-6.84
NYS 54.00 27.25	Stratus Computer Inc. (H)	54.00	2.13	4.10
NYS 17.63 9.50	Tandem Computers Inc.	14.50	-1.13	-7.85
OTC 4.75 1.25	Tandon Corp.	1.75	-0.19	-10.70
OTC 32.38 12.75	Teradata Corp.	30.13	-0.50	-1.63
NYS 11.75 3.25	Univsys Corp. (H)	9.75	-1.00	-10.30
ASE 6.38 2.00	Wang Labs Inc. (W)	6.38	1.38	21.50

Software & DP Services

OTC 68.50 41.25	Adobe Systems Inc.	55.75	-2.25	-3.88
OTC 13.25 3.50	AI Corp. (H)	9.88	-0.63	-6.39
OTC 58.88 28.75	Adius Corp.	30.00	-0.25	-0.76
OTC 19.50 10.13	American Software Inc. (H)	19.50	0.75	4.00
OTC 20.00 6.25	Ask Computer Systems (H)	18.25	0.75	4.29
OTC 62.25 23.75	Autodesk Inc. (L)	61.88	-0.38	-0.63
OTC 37.75 17.00	Bachman Info. Systems (H)	33.00	-3.75	-10.20
OTC 42.50 25.88	BGS Systems Inc. (H)	41.00	0.00	0.00
OTC 59.00 33.00	Borland Int'l Inc.	58.63	-0.38	-0.63
OTC 86.75 39.50	Borland Int'l Inc.	73.00	0.00	0.00
OTC 11.25 4.75	CE Software	8.88	-0.13	-1.39
ASE 18.88 9.75	Cheyenne Software Inc.	17.88	-0.63	-3.38

Exch 52-Week Range

OTC 20.88 7.50	Cognics Inc.	10.75	-0.75	-6.52
NYS 16.63 7.25	Computer Associates* (H)	15.50	0.00	0.00
OTC 47.88 15.00	Easel Corp.	44.00	-1.25	-2.76
OTC 18.75 9.25	Goal Systems Int'l	13.25	0.25	1.92
OTC 32.50 11.50	Group Software	22.00	2.50	12.82
OTC 7.00 3.38	Hogan Systems Inc.	6.25	0.50	8.00
OTC 36.25 14.88	Information Resources (H)	31.75	-3.75	-10.56
OTC 33.00 4.88	Informix Corp. (H)	29.00	1.50	4.92
OTC 3.63 1.06	IntellCorp Inc.	1.94	-0.19	-8.80
OTC 31.50 16.25	Intergraph Corp.	19.00	-0.50	-2.58
OTC 15.00 4.88	Interleaf Inc. (H)	14.25	-0.38	-2.66
OTC 20.25 7.38	Intersolv Inc.	18.00	-0.25	-1.37
OTC 43.25 10.50	Knowledgeware Inc.	19.75	-0.25	-1.25
OTC 45.00 10.00	Legend Corp. *	40.88	-1.38	-3.25
OTC 40.75 18.00	Lotus Development *	33.00	0.50	1.54
OTC 7.88 2.38	Meca Software	7.13	0.50	7.55
OTC 16.75 6.75	Mentor Graphics (H)	15.13	0.25	1.65
OTC 31.00 9.75	Micrograph Inc.	29.00	0.00	0.00
OTC 133.25 60.50	Microsoft Corp. *	114.50	-4.00	-3.38
OTC 21.13 7.00	Oracle Corp. (H)	20.75	0.50	2.47
OTC 71.25 20.50	Parametric Technology	60.25	-2.75	-4.37
OTC 10.00 4.88	Phoenix Technologies	9.25	0.50	5.71
OTC 25.25 9.00	Platinum Technology	19.00	-2.00	-9.52
OTC 46.50 27.50	Progress Software	43.00	0.00	0.00
OTC 26.63 11.50	Quarterdeck Office Sys.	23.75	-0.50	-2.06
OTC 29.75 10.00	Rasterops	24.75	0.75	3.06
OTC 18.75 6.75	Ross Systems	17.25	0.75	4.38
OTC 35.25 12.50	Software Publishing Corp.	22.50	-0.38	-1.64
OTC 8.50 2.00	Software Toolsworks Inc.	7.00	-0.38	-5.38
OTC 7.25 1.75	Spartan Software	2.13	-0.50	-23.33
OTC 13.75 6.25	State of the Art	12.50	-0.25	-1.96
OTC 25.25 10.50	Starling Software Inc. (H)	20.88	-1.13	-5.24
OTC 30.00 10.00	Struct. Dynamics Research	21.50	-2.50	-10.34
OTC 31.75 10.50	Sybase Inc. (H)	28.75	-0.50	-1.71
OTC 51.00 19.50	Symantec Corp.	43.25	-1.00	-2.28
OTC 11.58 11.75	Systems Center Inc. *	11.75	0.00	0.00
OTC 29.75 8.34	System Software Assoc. (H)	29.38	1.13	3.96
OTC 6.63 1.81	Wordstar	3.63	-0.06	-1.71

Semiconductors

NYS 21.50 7.25	Advanced Micro Devices	19.50	0.13	0.65
OTC 12.75 7.98	Analog Devices Inc.	9.50	0.50	5.26
OTC 18.88 6.75	Atmel Corp.	10.75	-0.75	-6.52
OTC 13.50 7.00	Chips and Technologies	13.25	0.38	2.91
NYS 24.50 13.58	Cypress Semiconductor Corp.	16.00	0.25	1.56
OTC 12.38 6.25	Dallas Semiconductor	8.63	-0.25	-2.82
OTC 68.75 30.50	Intel Corp. (H)	67.75	0.63	0.93
NYS 12.50 6.50	LSI Logic Corp.	9.50	0.25	2.70
OTC 22.38 10.88	Micron Technology (H)	20.88	0.00	0.00
NYS 82.50 54.00	Motorola Inc. (H)	81.00	0.00	0.00
NYS 10.88 3.88	National Semiconductor (H)	10.88	0.63	6.10
OTC 27.13 13.00	Sierra Semiconductor	23.75	0.75	3.19
NYS 47.63 26.00	Texas Instruments *	39.25	1.50	3.97
OTC 12.25 5.88	VLSI Technology	9.75	-0.13	-1.27
OTC 11.58 4.50	Western Digital Corp.	4.25	-0.13	-2.86
OTC 32.50 17.25	Xilinx	29.75	0.25	0.85
OTC 11.50 4.25	Zilog Inc. (H)	9.88	0.75	-7.06

Peripherals and Subsystems

OTC	2.75	1.00	Aperius Technologies	1.28	0.03	2.48
OTC	9.13	2.75	Archive Corp.	5.50	0.00	0.00
OTC	21.00	9.50	Archway Inc.	20.25	0.25	1.25
OTC	23.50	4.88	Camdex Corp. (H)	20.00	-2.50	-11.11
OTC	11.00	5.00	Cognitronics Corp.	11.00	0.00	0.00
NYS	29.00	12.50	Conner Peripherals*	21.13	1.00	4.97
ASE	35.25	9.63	Dataram Corp. (H)	31.50	-2.00	-6.37
OTC	16.88	4.88	EMC Corp.	14.38	-1.13	-7.85
OTC	11.25	4.75	Emulex Corp.	5.75	-0.25	-4.17
OTC	24.00	14.75	Evans & Sutherland	18.25	-1.50	-7.59
OTC	40.25		Exxon Corp.	35.75	0.00	0.00
OTC	26.50	14.63	Intelligent Info. Systems (H)	26.50	5.38	25.45
OTC	11.25	4.00	Iomega Corp. (H)	11.00	0.00	0.00
OTC	16.00	5.00	Interphase Corp.	11.25	0.00	0.00
OTC	24.50	11.75	Komag Inc.	18.50	0.50	2.78
OTC	10.00	1.63	Maxtor Corp. *	10.00	1.06	11.88
OTC	10.00	1.50	Microdisc Corp.	9.00	0.63	9.88
NYS	98.75	33.50	3M Corp.	93.75	1.50	1.66
OTC	10.75	3.50	Phintrex Inc.	11.25	4.25	-5.00
OTC	10.75	3.50	Phintrex Inc.	14.63	2.50	-10.53
OTC	18.25	8.88	Quantum Corp.	17.63	0.63	3.86
OTC	12.25	5.00	Radius Inc.	10.75	0.25	2.33
OTC	11.38	3.38	Recognition Equipment (H)	11.00	0.00	0.00
OTC	11.88	5.38	Revox Inc. (H)	11.50	0.75	6.89
OTC	7.13	1.13	Sesagate Technology *	6.13	0.13	1.33
NYS	78.00	26.25	Storage Technology *	72.50	-1.00	-1.33
NYS	30.88	16.00	Tektronix Inc.	16.63	-1.25	-4.62
OTC	0.16	0.16	Teladine Systems (H)	0.00	0.00	0.00
NYS	82.25	51.50	Xerox Corp. (H)	78.25	-1.00	-1.42

COMPUTER INDUSTRY

IN BRIEF

Storage Tek puts in bid

■ Louisville, Colo.-based **Storage Technology Corp.** is bidding to acquire its publicly held Scandinavian distributor, Stockholm-based **Edata Scandinavia AB**, in a stock purchase valued at approximately \$75 million. Europe contributes some 33% of Storage Tek's 1991 bottom line — a figure approximately twice that of Europe's contribution to 1989 revenue.

■ Earlier this month, a Galveston, Texas, jury shocked industry observers with its award of \$568 million in punitive damages against investment banking firm **Hambrecht & Quist, Inc.** and accounting firm **Coopers & Lybrand** in the near-legendary Miniscribe disk drive fraud case. Among the shocked, apparently, was the judge: Last week, he set aside the verdict, contending it was unsupported by the evidence. The plaintiffs — investors who alleged that misleadingly rosy financial statements lured them to back an actually flagging disk drive firm — had claimed the firms played a role in the deception.

Dealing in Japan: Tough, but worth it

U.S. computer firms find the Japanese demand a quality product — and are willing to pay for it

BY GARY H. ANTHERS
CW STAFF

WASHINGTON, D.C. — Despite difficulties surmounting barriers to the \$60 billion Japanese market, U.S. vendors that have broken through report high profits and say their efforts in Japan will provide valuable benefits for operations elsewhere.

Japan is still the toughest market in the world, in spite of its recent pledge to open its public institutions to U.S. computer firms. Foreign companies face an array of barriers stemming from cozy alliances between Japanese vendors and users to Japanese old-boy networks and distribution systems effectively closed to outsiders.

Nevertheless, U.S. suppliers with experience in what is the second largest computer market in the world are optimistic.

"The bias [in Japanese companies] is first to buy from your own company and second to buy from a Keiretsu partner," said William Krist, vice president of international trade at the American Electronics Association (AEA). "If all else fails, you buy from another Japanese company, and only in desperation do you buy from a foreigner."

Despite these de facto trade barriers, U.S. companies should not be afraid to take the Japanese plunge, said Edmund J. Reilly, president of Digital Equipment Corp. Japan and president of the American Chamber of Commerce in Japan. "U.S. companies read all the negative press and

say, 'I'll go to Europe, or I'll go to Canada. I can't go to Japan because I can't be successful there,'" he said.

Reilly said Japan has opened up substantially in the past decade, with many small U.S. software firms going in successfully and U.S. high-technology firms competing more aggressively in general.

One lesson learned is that demanding Japanese buyers have forced U.S. suppliers to become more quality-conscious. Japanese customers will not accept a computer that arrives with a

scratch in its cabinet, and they expect new software to be completely bug-free, according to Reilly.

In response, DEC has established a mechanism for feeding back quality improvement ideas developed in its Japanese operations to DEC facilities around the world, Reilly said.

The demands for quality provide a payoff for companies that can measure up, with ultrafussy Japanese buyers often willing to pay premium prices. "Once you've overcome the hurdles, it's a very profitable market," Reilly said.

DEC Japan posted a pretax

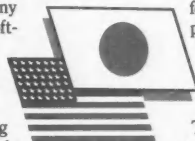
profit of some \$66 million on sales of \$1 billion last year, while the company as a whole achieved about half that percentage profit margin exclusive of a onetime restructuring charge.

While foreign competition is vigorous in Japan's \$50 billion private-sector market for hardware, software and computer services, it is almost nonexistent in the \$9 billion public-sector market, where sales contracts tend to go automatically to the Japanese incumbents. But during President Bush's visit there last month, Japan agreed to sweep away virtually all the practices that have for years locked foreign firms out of government agencies, schools and hospitals [CW, Jan. 20].

Industry observers said that agreement is likely to bear more fruit than previous Japanese pledges because the government can more easily modify its own behavior than that of private Japanese companies. However, some U.S. executives said they believe a vigorous monitoring program by the U.S. will be needed.

In any case, Japanese computer companies are not likely to willingly cede their cozy relationships with buyers. "They will fight like a cat in a corner for that market because their profit margins are higher there," Reilly said.

He said the U.S./Japan relationship is good overall, with very strong ties and shared values in three key areas: defense, politics and culture.



Steel to software

Computer firms in the U.S. wishing to do business in Japan may get competition from unexpected quarters.

Nippon Steel Corp., for example, has emerged as one of the largest software companies in the world, according to Edmund J. Reilly, president of DEC Japan. Faced with financial difficulties but adamantly refusing to relax its no-layoffs policy, Nippon turned excess steel factory workers into software factory workers, two-thirds of whose software now goes outside Nippon.

Last year, Nippon provided \$80 million in financing to Oracle Corp. in a deal that will allow Nippon to buy up to 25% of a new Oracle Japan subsidiary [CW, Dec. 16, 1991].

Reilly said Nippon's steel workers are educated, disciplined, oriented to process technologies and steeped in a culture of standards and quality — all traits helpful in software development. "It may have taken Nippon two years to train them, but the company was willing to do that," he said.

GARY H. ANTHERS

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By the end of this week
Computerworld readers will have spent
over \$12.4 Billion on
Information Technology this year — representing nearly half of
all IT spending to date in 1992.

COMPUTERWORLD

The Newspaper of IS

Source: IDC Research Services, Fall 1991

TRENDS

digital

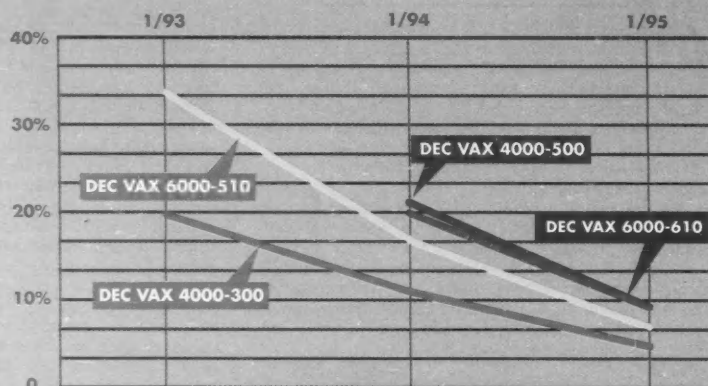
Retail residual value projections

Model	Announced	List price	1/93	1/94	1/95
DEC VAX 4000-300	7/90	\$75,700	\$15,140	\$8,327	\$3,785
DEC VAX 4000-500	10/91	\$133,900	New*	\$28,119	\$12,051
DEC VAX 6000-510	10/90	\$220,650	\$75,021	\$37,511	\$15,446
DEC VAX 6000-610	10/91	\$247,000	New*	\$49,400	\$22,230

"Residual values on DEC's VAX systems continue to be low as DEC's product life cycles decrease and price/performance improvements continue to increase."

— Karlyn Gale, senior research analyst, Technology Investment Strategies Corp.

Projected used retail value as a percentage of list price



*This equipment is being marketed by the manufacturer and/or other distributors as new at the manufacturers' list price or at a discount to that list price.

Source: Technology Investment Strategies Corp., Framingham, Mass.

CW Chart: Michael Siggins

NEXT WEEK

Converting paper records to electronic images means more than getting rid of file folders for Eunice Little at San Jose Medical Center. The hospital is cutting major expenses in its medical records department and may even be able to bring in new revenue, thanks to its network of image workstations. See Workgroup Computing next week.



Andy Freeberg

Despite tough times, retailers continue to explore and invest in strategic technology for check-out lines and other points of customer contact. Besides sophisticated new point-of-sale systems, firms such as Walmart, Kmart and Saks Fifth Avenue are exploring exotic technologies such as "smart carts." See next week's Executive Report.

INSIDE LINES

Running short on Alpha bits

► DEC's Alpha RISC chip, due out this week, will not debut purely in 64-bit form, a DEC spokesman told a source close to the company. While an OSF/1 version will support a full 64-bit RISC architecture, the crucial VMS version will initially arrive in 32-bit architecture. It will be upgraded to 64 bits in a couple of years, the DEC spokesman told our source.

Scribbling systems

► IBM is reportedly working on a machine featuring a 5- by 7-in. screen and weighing less than 3 pounds. IBM's collaborative efforts with Go Corp. will also yield a tablet machine that will sport a pen-based version of IBM's OS/2 Presentation Manager GUI, wherein data can be entered through a stylus, and overlapping documents can be moved around the screen by dragging them with a fingertip. The machine will also offer voice annotation capabilities.

Sweaty palms

► HP will introduce an enhanced version of its 95LX on March 4. The palmtop will now have 1M byte of memory, up from 512K bytes. This follows last week's announcement that it will support Apple Macintosh programs with the help of Ex Machina's Notify gateway software.

Buying spree?

► Automatic Data Processing (ADP) is shopping for companies to buy. The Roseland, N.J., concern recently said it has netted approximately \$243 million by selling notes convertible to ADP common stock for "general corporate purposes, including possible acquisitions." Among the candidates are human resources software vendors Peoplesoft in Walnut Creek, Calif., and Tesseract Corp. in San Francisco, an analyst confirmed. Spokesmen for the companies involved either refused to comment or were unavailable.

The first collar

► Arizona law enforcers are fuming that the U.S. Justice Department is taking credit for the first successful prosecution under the Operation Sundevil computer crime investigation [CW, Feb 17]. They point out that they nabbed and convicted two hackers swept up in the nationwide crackdown on computer crime several months ago. One of the hackers is still doing time in a halfway house after spending six months in "shock incarceration," a boot camp for first-time offenders.

Ante up

► Clarion Software has found a rather novel way of raising funds to pay for product development — get your users to pay for it up front. According to company President Bob Shumate, U.S. users of Clarion Professional Developer were invited to order Version 3.0 of the product long before its shipment date of later this year. Anyone willing to buy early would receive a \$75 discount off the normal \$250 upgrade price and would be placed high on the list for upgrades. Some 40% of Clarion users have taken the company up on the offer, Shumate said.

Regal CIO

► Mellon Bank filled its long-vacant top IS position last week, naming Bipin C. Shah executive vice president of information management and research. Shah, 53, was the top IS executive at Philadelphia-based Core States Bank before he resigned as chief operating officer there one year ago. The Mellon job, held for many years by George DiNardo, became vacant last fall when replacement Keith Russell was promoted to a business post just two months after he was hired.

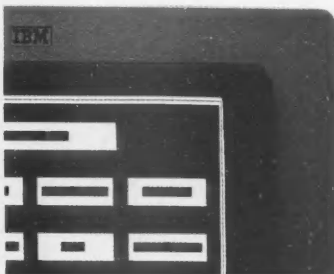
CASE guru Ed Yourdon joked last week that IBM sales reps are getting so desperate to move AD/Cycle that they're advertising in the back of the magazines found in upright seat-backs of airplanes. On the flight to Santa Clara, Calif., for CASE World, Yourdon supposedly read an ad that said, "For 10,000 frequent flyer miles you, too, can have AD/Cycle." The jibe continued: "For another 1,000, we'll throw in Knowledgeware." Yourdon quipped, "Is that the tool or the entire company?" Got any AD/Cycle tales of woe? Phone, fax or Compuserve News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively.

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An open letter to dBASE users

From Philippe Kahn, Chairman of Borland



I am proud to announce dBASE IV® version 1.5, the first version of dBASE® since we acquired Ashton-Tate four months ago, is now available.

Version 1.5 is a faster, easier-to-use and more powerful version of dBASE. New features include mouse support, faster Query By Example data retrieval, 40 work areas, new BLANK support that lets you detect when fields are empty, open architecture Control Center, editable multi-file views, C language-like file I/O so dBASE programs can read and write files of any type, as well as other enhancements.

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